S. HRG. 111–1224

HEARING ON THE NOMINATIONS OF ARTHUR ELKINS TO BE INSPECTOR GENERAL OF THE EPA; EARL GOHL TO BE FEDERAL COCHAIR OF THE APPALACHIAN REGIONAL COMMISSION; SANDFORD BLITZ TO BE FEDERAL COCHAIRPERSON OF THE NORTHERN BORDER REGIONAL COMMISSION; AND MARILYN A. BROWN, BARBARA S. HASKEW, NEIL G. MCBRIDE, AND WILLIAM B. SANSOM TO BE MEMBERS OF THE BOARD OF DIRECTORS OF THE TENNESSEE VALLEY AUTHORITY

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

FEBRUARY 9, 2010

Printed for the use of the Committee on Environment and Public Works

Available via the World Wide Web: http://www.gpo.gov/fdsys

U.S. GOVERNMENT PUBLISHING OFFICE
21–161 PDF WASHINGTON : 2016

For sale by the Superintendent of Documents, U.S. Government Publishing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED ELEVENTH CONGRESS
SECOND SESSION

BARBARA BOXER, California, *Chairman*

MAX BAUCUS, Montana
THOMAS R. CARPER, Delaware
FRANK R. LAUTENBERG, New Jersey
BENJAMIN L. CARDIN, Maryland
BERNARD SANDERS, Vermont
AMY KLOBUCHAR, Minnesota
SHELDON WHITEHOUSE, Rhode Island
TOM UDALL, New Mexico
JEFF MERKLEY, Oregon
KIRSTEN GILLIBRAND, New York
ARLEN SPECTER, Pennsylvania

JAMES M. INHOFE, Oklahoma
GEORGE V. VOINOVICH, Ohio
DAVID VITTER, Louisiana
JOHN BARRASSO, Wyoming
MIKE CRAPO, Idaho
CHRISTOPHER S. BOND, Missouri
LAMAR ALEXANDER, Tennessee

Bettina Poirier, *Staff Director*
Ruth Van Mark, *Minority Staff Director*

C O N T E N T S

Page

FEBRUARY 9, 2010

OPENING STATEMENTS

- Snowe, Hon. Olympia J., U.S. Senator from the State of Maine 2
- Collins, Hon. Susan M., U.S. Senator from the State of Maine 3
- Brown, Hon. Sherrod., U.S. Senator from the State of Ohio 5
- Cardin, Hon. Benjamin L., U.S. Senator from the State of Maryland 7
- Corker, Hon. Bob, U.S. Senator from the State of Tennessee 10
- Alexander, Hon. Lamar, U.S. Senator from the State of Tennessee 11
- Boxer, Hon. Barbara, U.S. Senator from the State of California 13
  - Prepared statement 76
- Inhofe, Hon. James M., U.S. Senator from the State of Oklahoma, prepared statement 331

WITNESSES

- Elkins, Arthur A., Jr., nominated to be Inspector General, U.S. Environmental Protection Agency 42
  - Prepared statement 45
  - Responses to additional questions from:
    - Senator Boxer 49
    - Senator Inhofe 51
    - Senator Vitter 52
    - Senator Barrasso 53
- Gohl, Earl, Jr., nominated to be Federal Cochair, Appalachian Regional Commission 54
  - Prepared statement 56
  - Responses to additional questions from:
    - Senator Boxer 60
    - Senator Cardin 62
    - Senator Inhofe 65
- Blitz, Sandford, nominated to be Federal Cochairperson, Northern Border Regional Commission 68
  - Prepared statement 70
  - Responses to additional questions from Senator Boxer 72
  - Response to an additional question from Senator Inhofe 74
- Brown, Marilyn A., nominated to be a Member, Board of Directors, Tennessee Valley Authority 78
  - Prepared statement 79
  - Responses to additional questions from:
    - Senator Boxer 219
    - Senator Carper 222
    - Senator Inhofe 225
    - Senator Alexander 227
- Haskew, Barbara S., nominated to be a Member, Board of Directors, Tennessee Valley Authority 229
  - Prepared statement 231
  - Responses to additional questions from:
    - Senator Boxer 249
    - Senator Carper 252
    - Senator Inhofe 255
    - Senator Alexander 257

Page
McBride, Neil G., nominated to be a Member, Board of Directors, Tennessee Valley Authority 259
  Prepared statement 260
  Responses to additional questions from:
    Senator Boxer 300
    Senator Carper 303
    Senator Inhofe 306
    Senator Alexander 309
Sansom, William B., nominated to be a Member, Board of Directors, Tennessee Valley Authority 311
  Prepared statement 312
  Responses to additional questions from:
    Senator Boxer 314
    Senator Carper 317
    Senator Inhofe 322
    Senator Alexander 324

HEARING ON THE NOMINATIONS OF ARTHUR ELKINS TO BE INSPECTOR GENERAL OF THE EPA; EARL GOHL TO BE FEDERAL COCHAIR OF THE APPALACHIAN REGIONAL COMMISSION; SANDFORD BLITZ TO BE FEDERAL COCHAIRPERSON OF THE NORTHERN BORDER REGIONAL COMMISSION; AND MARILYN A. BROWN, BARBARA S. HASKEW, NEIL G. MCBRIDE, AND WILLIAM B. SANSOM TO BE MEMBERS OF THE BOARD OF DIRECTORS OF THE TENNESSEE VALLEY AUTHORITY

TUESDAY, FEBRUARY 9, 2010

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The full committee met, pursuant to notice, at 2:30 p.m. in room 406, Dirksen Senate Office Building, Hon. Barbara Boxer (chairman of the committee) presiding.

Present: Senators Boxer, Alexander, Cardin, Barrasso, and Whitehouse.

Also present: Senators Snowe, Collins, Brown, and Corker.

Senator BOXER. I want to thank everyone for being here today. I am so pleased we have so many Senators here. We are going to get right to the introductions so that Senators who are here can get back to their busy schedules.

We are going to hear today on the first panel the EPA Inspector General, and that would be Arthur Elkins and Earl Gohl, to be Federal Cochair of the Appalachian Regional Commission, and Sandford Blitz to be Federal Cochair of the Northern Border Regional Commission.

And then on the second panel, and we really thank these very brave TVA nominees for going to the airport, coming back from the airport, now headed out to the airport after this, we will hear from you. And those are Marilyn A. Brown, Barbara S. Haskew, Neil G. McBride, and William B. Sansom to be on the board of the Tennessee Valley Authority.

So in deference to our colleagues who are here, Senator Cardin, is it OK if I allow them to do their introductions; is that all right? Or would you like to go first?

Senator CARDIN. I want to introduce one of them.

Senator BOXER. OK. Well, why don't we just start from Senator Snowe, Senator Collins, Senator Brown. Oh, and I didn't see—Senator Corker, did you just join the crowd over there? Senator Corker, we are very happy you are here as well.

Go ahead, Senator Snowe.

OPENING STATEMENT OF HON. OLYMPIA J. SNOWE, U.S. SENATOR FROM THE STATE OF MAINE

Senator SNOWE. Thank you, Madam Chair, and I want to thank Senator Cardin as well and all the members of the committee. Let me express my sincere appreciation to you and the entire committee for your timely consideration in scheduling of this hearing and to all the distinguished members.

It is my distinct privilege to join Senator Collins in introducing the President's nominee for Federal Cochair of the Northern Border Commission, Sandy Blitz. He is truly an icon of economic development in Maine and has been a friend for many years. It has been recommended by the entire congressional delegation, including Congressman Mike Michaud and Chellie Pingree. I also want to welcome Sandy's wonderful wife, Mona, who is here today. I know this is a proud moment as they look forward to a new chapter in Sandy's continuing dedication to his country and his lifetime devoted to creating jobs, strengthening our economy and expanding small businesses and entrepreneurship in our rural regions.

Madam Chair, indisputably, economic development in all areas of our Nation is key to our country's economic recovery and expansion. Specifically, unemployment in the non-metropolitan towns in Maine is 13 percent higher than in metropolitan regions of the State. Unfortunately, as Senator Sanders and Senator Gillibrand of this committee are all too aware, this staggering unemployment figure permeates throughout the northern tier of New York, Vermont, New Hampshire and Maine. These counties and States are part of pervasive and severe regional economic distress. For example, with 9.4 percent unemployment in Coos County, New Hampshire, 10.4 percent in Fulton County, New York, 11 percent in Essex County, Vermont, and 11.8 percent in Piscataquis County, Maine.

So it is absolutely vital at this moment that we bolster the Economic Development Administration, whose mission is to generate jobs in economically distressed areas of the United States. That is why I have always been a fierce champion for EDA throughout my tenure in the House and Senate because it builds indispensable lifelines to these communities.

With that imperative in mind I sponsored the legislation, along with Senator Collins, to establish the Northern Border Commission, which we worked hand in glove along with Congressman Michaud, who spearheaded this visionary initiative. I was very pleased that this innovative economic development approach was included in the farm bill, with its primary focus on collaboration to address the severe unemployment and chronically low wages that are regrettably typical of these northeastern States.

I can tell you firsthand there could not be a more ideal person to inaugurate the Commission than Sandy Blitz, whose 28 years of rural economic experience has been defined by a cumulative depth and breadth of experience and expertise and a passion for economic development that will be indispensable in transforming the Commission's objective into action, to hit the ground running to expeditiously address the lack of jobs in rural counties with the sense of urgency that is required. Time and again Sandy has been a pit bull for economic development, battled the bureaucracies to bring jobs to rural areas. Specifically, as EDA's Maine regional representative Sandy served for 13 years as chief architect of Maine's economic development strategy. And for the final 2 years at EDA, he was tapped to expand his leadership to include Connecticut and Rhode Island.

During this time Sandy developed a reputation not only as a strategic planner but as an individual who executes these plans, making them a reality. For example, Sandy worked with the city of Eastport, Maine, to develop their world class deepwater harbor into a world class port, bringing jobs to Washington County where 20 percent of the population is below the poverty level, and one of counties that would be under the purview of this commission. As a result of his work, shipments out of the port have more than doubled.

Most recently, Sandy served with distinction as regional administrator of the Small Business Administration for the six New England States. As Ranking Member of the Small Business Committee, I have worked closely with Sandy to ensure that New England's 1.4 million small businesses have the loans and financing to grow and expand. Additionally he brought his extensive knowledge of the Federal Government to bear as he counseled numerous entrepreneurs seeking to start their own firms or expand operations. Sandy was a tireless and determined advocate for their success.

If confirmed, Sandy will have served under every President since President Gerald Ford and has a reputation for working with anyone who is serious about job creation. As Federal Cochair he will build on his accomplishments in these leadership positions and develop cross-State boundary efforts that will preserve the traditional industries of the region, catalyze new rural economic and small development and job growth and slow the out-migration that has been the scourge of many of our rural areas. No one has more collective experience than Sandy to work with the Federal and State agencies to tackle these issues that so many families are grappling with across the region. And certainly this commission could not be more timely nor led by a more qualified individual.

Thank you, Madam Chair.

Senator BOXER. Mr. Blitz, if I were you, I would just put my statement in the record.

[Laughter.]

Senator BOXER. You are rounding third base.

And now we are going to hear from Senator Collins.

OPENING STATEMENT OF HON. SUSAN M. COLLINS, U.S. SENATOR FROM THE STATE OF MAINE

Senator COLLINS. Thank you, Madam Chairman.

I was just thinking as I listened to Senator Snowe's eloquent testimony on behalf of the nominee that I actually should just say ditto and leave immediately. But instead I am going to take advantage of this opportunity because I cannot imagine a better person for the President to have nominated than Sandy Blitz to be the first Federal Cochair of the Northern Border Regional Commission. Since this is a new commission it is absolutely imperative that the first Cochair be an individual of extraordinary experience and exceptional qualification. And in Sandy Blitz the President has nominated such a person.

Throughout his career Sandy has been dedicated to building partnerships between government and the private sector to create jobs. Sandy's experience with local government dates back to the 1970s where he worked for the mayor of Bridgeport, Connecticut, for several years. He has also held numerous Federal positions, with the General Services Administration, the Economic Development Administration and most recently with the Small Business Administration. For several years, Sandy served as the executive manager of the Bangor, Maine, Target Area Development Corporation and worked with the Eastern Maine Development Corporation.

In addition he has operated his own private consulting firm. He has served as an adjunct professor at the University of Maine. And he has helped the University develop resources to bring research projects to market. His counsel has been sought by government, business and academia for virtually every aspect of economic development.

Sandy is also steeped in the challenges and potential of the areas that will be served by the Northern Border Regional Commission. For more than 10 years he has worked tirelessly and frequently without pay to bring the people of this entire region together. He has developed a ground breaking map of the region which shows county by county the widespread effects of economic stagnation in the Northern Border region. This map reveals the economic distress that is at times masked when the data are examined only at the State level.

Sandy developed many of the concepts that ultimately led to the introduction of the legislation that created this new commission. And I too want to recognize the work that was done on the House side by Congressman Mike Michaud in developing the Commission. Senator Snowe and I were pleased to lead the effort on the Senate side. He has served as the public member on an unprecedented committee composed of transportation authorities from Ontario, Quebec, the Atlantic provinces in Canada, and Maine, New Hampshire, Vermont and New York. This committee studied multi-modal transportation links across that broad region. It produced the Can-Am study, which will greatly assist Sandy and the Commission members as they analyze what is working and what is not working across the Northern Border region.

I worked very closely, as did my colleague, Senator Snowe, with Sandy when he was the regional administrator of SBA and during his many years at EDA. Sandy will bring extraordinary talent and experience to the Northern Border Regional Commission, because he truly understands the people of the region and the challenges it faces.

I am convinced that the President could have found no better nominee for this important position than Sandy, and I am pleased and proud to join my senior colleague from Maine, Senator Snowe, in offering him my strong support.

Thank you, Madam Chairman.

[The prepared statement of Senator Collins follows:]

STATEMENT OF HON. SUSAN M. COLLINS, U.S. SENATOR FROM THE STATE OF MAINE

Chairman Boxer, Senator Inhofe, and members of the committee, I am delighted to testify today on behalf of Sandy Blitz, who has been nominated to serve as the first Federal Co-Chair of the Northern Border Regional Commission. Sandy is joined here today by his wife, Mona.

Throughout his career, Sandy has been dedicated to building partnerships between government and the private sector to create opportunity.

Sandy's experience with local government dates to the early 1970s when he worked for the Mayor of Bridgeport, Connecticut, for several years. He has also held important Federal positions with the General Services Administration, the Economic Development Administration, and most recently with the Small Business Administration.

For many years, Sandy served as the Executive Manager of the Bangor (Maine) Target Area Development Corporation and worked with the Eastern Maine Development Corporation. In addition, he has operated his own private consulting business, served as an adjunct assistant professor at the University of Maine, and helped the University develop resources to bring research projects to market. His counsel has been sought by government, business, and academia for virtually every aspect of economic development.

Sandy is also steeped in the challenges and potential of the area that will be served by the Northern Border Regional Commission. For more than 10 years, he has worked tirelessly—and frequently without pay—to bring the people of this region together. He developed a groundbreaking map of the region (using criteria established by the Department of Commerce) which shows, county by county, the widespread effects of economic stagnation in the northern border region. This map reveals economic distress that is masked when the data are examined only at the State level.

Sandy developed many of the concepts that ultimately led to the introduction of the legislation that created the Northern Border Regional Commission. He also served as the public member on an unprecedented committee composed of transportation authorities from Ontario, Quebec, the Atlantic Provinces, Maine, New Hampshire, Vermont, and New York. This committee studied the multi-modal transportation links across that broad region. It produced the CanAm Study, which will greatly assist Sandy and the Northern Border Regional Commission as they analyze what is working and what is not working in the northern border region.

I worked closely with Sandy when he was the Regional Administrator at SBA and during his many years at EDA. Sandy will bring extraordinary talent and experience to the Northern Regional Border Commission because he truly understands the economic challenges facing our region. I am convinced that the President could have found no better nominee for this important position than Sandy Blitz, and I am pleased and proud to offer him my support.

Senator BOXER. Thank you so very much. And Senators, I know you have other things that you have to attend to, so as soon as you wish to, leave. Of course, we thank you for coming.

Senator Brown, I understand you are here to speak for one of our nominees, Mr. Elkins, who is up for Inspector General of the EPA.

OPENING STATEMENT OF HON. SHERROD BROWN, U.S. SENATOR FROM THE STATE OF OHIO

Senator BROWN. I am, thank you, Madam Chair. Thank you to Senator Alexander, Senator Barrasso and Senator Cardin.

I am pleased to introduce to the four of you and to this committee Arthur Elkins, Jr., nominated to serve as Inspector General of the Environmental Protection Agency. He is joined by his wife, Gail, who is sitting behind me, and we welcome her.

You know that Mr. Elkins comes from Ohio because he and his wife didn't break a sweat to get here in the snow.

[Laughter.]

Senator BROWN. It is an important moment for EPA and for U.S. taxpayers. American taxpayers should be able to trust that programs ensuring clean water, Superfund clean up and brownfields redevelopment are being managed in an effective and cost efficient manner, the kinds of work over which jurisdiction this committee is so important. American taxpayers need to know that EPA is not doing more harm than good. It is especially true when it comes to regulating CO_2 emissions. Climate change is an important environmental issue and economic issue and global security issue. We must have a smart, independent IG at this critical juncture. Arthur Elkins, Jr., I believe, is that person.

The committee should know that Mr. Elkins' credentials and broad career experience speak for themselves. Arthur has practiced law for some 20 years, including stints at the Cuyahoga County, that is Cleveland, Cuyahoga County Public Defenders and Prosecutors offices, the Department of Defense, the National Science Foundation, the Court Service and Offender Supervision Agency, and for the past year the U.S. Environmental Protection Agency. He worked under the tutelage of Senator Cardin's seat mate on the Ways and Means Committee, Stephanie Tubbs Jones, when she was a county prosecutor in Cleveland.

Mr. Elkins has served as a prosecutor, a trial attorney, a general counsel, and while at the National Science Foundation as counsel to the Inspector General. That is his public sector experience. His impressive list of public sector achievements parallels his extensive private sector experience. Prior to his career as a public servant Mr. Elkins, in fact before he went to law school, worked as a teacher and in the sales department for a number of important Ohio companies. This wide ranging experience will serve him well as he looks for waste, fraud and abuse across the numerous programs at the Environmental Protection Agency.

His dedication to public service, his work as a fair and independent arbiter bode well for his success in the difficult but very, very important job of this Inspector General. I encourage the committee to take a close look at this qualified candidate and urge you to move quickly on his confirmation and nomination.

I thank the Chair.

Senator BOXER. Senator Brown, thank you, and of course we know you have other things to attend to.

What I would like to do is hear from Senator Cardin, who also would like to introduce Mr. Elkins. And then I will turn to Senators Alexander and Corker in whatever order they wish, Corker first, Alexander next, to talk about some of our TVA people, who we are so happy did make it here. So good work, Senator, for making sure this really happened.

Senator ALEXANDER. Thanks to the Chairman for her flexibility.

Senator BOXER. Right, we were flexible; we got it done.

Senator Cardin.

OPENING STATEMENT OF HON. BENJAMIN L. CARDIN, U.S. SENATOR FROM THE STATE OF MARYLAND

Senator CARDIN. Madam Chair, let me just add one thing to Senator Brown's introduction of Arthur Elkins, and that is he is now a resident of Bowie, Maryland. So he may have gotten his training in Ohio, but he had enough sense to come to Maryland. So we want to welcome him to our State. I am sure that he got here on time because he is a good Marylander. We thank him.

If you are looking at what should be the appropriate background for an inspector general, look at Mr. Elkins' resume, look at what he has done, look at the type of experience he has had in the public sector and the private sector. He has devoted his career to this type of work. So we very much look forward to his continued public service. I strongly endorse his nomination.

I will just add one additional point, if I might. In Maryland, we are very interested in what is happening with the Chesapeake Bay and the EPA program in the Chesapeake Bay. I have introduced legislation which I hope we will pass in this Congress. It would, I think, help us enforce the water qualities necessary in the Bay. The Environmental Protection Agency has their program, which I support, which will enforce the maximum daily loads.

The reason I mention that with Mr. Elkins is that we need to make sure that there is a very open process with all the stakeholders who are going to be impacted by that. I think the Inspector General can help us a great deal to make sure that we have the type of credibility as that program moves forward that will have the confidence of all the stakeholders and yet be able to at last accomplish the type of water quality that we want to see in the Chesapeake Bay that Congress has spoken to and the Administration is implementing.

As I look at Mr. Elkins' background I can tell you I have a lot of confidence that he will do exactly that. He clearly has a lot of experience in Ohio, and we thank Senator Brown for the way that he has brought that to our attention. We look forward to working with Mr. Elkins, and I thank you very much for your continued public service.

[The prepared statement of Senator Cardin follows:]

STATEMENT OF HON. BENJAMIN L. CARDIN, U.S. SENATOR FROM THE STATE OF MARYLAND

Thank you, Madam Chairman, for holding this hearing this afternoon. I also want to thank our witness for coming before our committee and wish them the best with the proceeding of their confirmations.

As EPA takes on new initiatives to better protect the environment the role of the IG will be incredibly important to make sure that regulations put forth are understood and followed to achieve the goal of protecting public health and the environment.

I was very pleased last summer when the President announced his Executive Order to make the restoration of the Chesapeake Bay an environmental priority for the EPA. I applaud this initiative and am working hard myself to pass legislation to bring about the restoration of the Bay. I understand how important it is to work with stakeholders in my State and throughout the watershed to accomplish the task of restoring the Bay.

As I advance my Chesapeake Bay Ecosystem Restoration Bill I am committed to keeping the process open for input from the public, and I would encourage the EPA to do the same with its rulemaking and the establishment of the 78 TMDLs that will be vital to putting the Bay on its necessary "Pollution Diet."

Implementing this program is going to require an open approach as well, and I would encourage the Office of Inspector General to keep watch of how the Agency implements the Bay restoration program and give careful guidance and advice to the Bay Program on being inclusive and open with the public, particularly with stakeholders like farmers and developers that will bear the burden of meeting these requirements.

I am hopeful that Arthur Elkins will help inform and facilitate this process.

STATEMENT ADDRESSED TO ARC CO-CHAIRMAN NOMINEE EARL GOHL

Western Maryland has benefited from several ARC projects including worker training programs, transportation improvement projects and expanded access to broadband communications services. For that I am grateful, and it is one of the reasons I worked very hard to help increase planning grants funding for my State and all Economic Development Districts.

The Tri-County Council of Western Maryland has a long history of working hand in hand with the Appalachian Regional Commission. I encourage you to keep this partnership strong.

One of the most important projects to Western Maryland and the region is the completion of the North/South Appalachian Highway. Dozens of companies, public officials, civic and public organizations in Western Maryland have made this project a No. 1 priority for the region. They all see the alignment and improvements to Routes 219 and 220 as critical infrastructure projects for improving and sustaining economic development in the region.

Improvements to these two roads are estimated to create upwards of 12,000 new permanent jobs and 20,000 construction jobs in the three affected States. These jobs are more important than ever to the region, and I am working hard to see that the remaining portions of the project in Maryland are realized.

ARC is an important facilitator of this project, and I encourage you and the leadership to make this project a priority for the Commission. To complete this entire project I urge your support for repealing the prohibition on the use of toll credits to fund the project. Granted this is an issue that Congress needs to resolve, but I want to urge the Administration, the Appalachian Regional Commission and you to support and advocate for this change to the law.

I look forward to the testimonies of our nominees, and I again thank the Chair and Ranking Member for holding this hearing.

Senator BOXER. All right. I ask unanimous consent that a letter in support of Mr. Blitz's nomination from Congressman Michaud be entered into the record. If there is no objection, we will put that in.

And Senator Corker, thank you so much for bearing with us in this last minute change. Please go right ahead, proceed.

[The referenced letter follows:]

MICHAEL H. MICHAUD
2nd District, Maine

WASHINGTON OFFICE
1724 Longworth House Office Building
Washington, DC 20515
Phone: (202) 225-6306
Fax: (202) 225-2943

www.michaud.house.gov

Congress of the United States
House of Representatives
Washington, DC 20515

Committees:
Veterans' Affairs
Subcommittee on Health
Chairman
Transportation and Infrastructure
Subcommittee on Highways and Transit
Subcommittee on Railroad, Pipelines
and Hazardous Materials
Subcommittee on Economic Development,
Public Buildings and
Emergency Management
Small Business
Subcommittee on Rural and Urban
Entrepreneurship
Subcommittee on Finance and Tax

February 9, 2010

Chairman Barbara Boxer
Senate Committee on
Environment and Public Works
410 Dirksen Senate Office Building
Washington, DC 20510

Ranking Member James M. Inhofe
Senate Committee on
Environment and Public Works
456 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Boxer and Ranking Member Inhofe:

I write in strong support of the nomination of Mr. Sandford Blitz to serve as the Federal Co-Chairperson for the Northern Border Regional Commission (NBRC). Having worked with Sandy Blitz for years, I am confident that his regional knowledge and his expertise in economic development will serve Maine and the entire region extremely well. He is an outstanding pick and should be confirmed so that he may begin the difficult and important work that awaits him.

Sandy Blitz has an exemplary record of service and experience. He has served as economic development representative for the U.S. Department of Commerce's Economic Development Administration and as regional administrator for the U.S. Small Business Administration's New England Region. Outside of the federal government, Blitz has served as director of the East-West Highway Association and as executive manager for the Bangor Target Area Development Corporation.

For decades, individuals living in Maine, New Hampshire, Vermont and northern New York have faced tough economic circumstances that have resulted in the loss of jobs and businesses, as well as a lack of new opportunities for displaced workers and young people. In authoring the language that created the Northern Border Regional Commission, I recognized that it is essential that our region address these obstacles in a targeted way that acknowledges that economic challenges cut across state lines. As a result, the Commission is uniquely positioned to confront the barriers to economic development that are shared throughout the region – barriers that will exist long after the national recession has ended.

If there was ever a time to get this commission off the ground, it is now. This commission will help our most economically distressed areas by funding projects that will create jobs and promote business development. Sandy Blitz has the knowledge, experience and work-ethic necessary to ensure that the Northern Border Regional Commission is ready to serve the region as quickly as possible. I am hopeful that you will work hard to ensure that the Senate confirms this position soon.

With warmest regards,

Mike

Michael H. Michaud
Member of Congress

BANGOR:
6 State Street, Suite 101
Bangor, ME 04401
Phone: (207) 942-6935
Fax: (207) 942-5907

LEWISTON:
179 Lisbon Street, Ground Floor
Lewiston, ME 04240
Phone: (207) 782-3704
Fax: (207) 782-5330

PRESQUE ISLE:
445 Main Street
Presque Isle, ME 04769
Phone: (207) 764-1036
Fax: (207) 764-1060

WATERVILLE:
16 Common Street
Waterville, ME 04901
Phone: (207) 873-5713
Fax: (207) 873-5717

OPENING STATEMENT OF HON. BOB CORKER, U.S. SENATOR FROM THE STATE OF TENNESSEE

Senator CORKER. Chairman Boxer and committee members, thank you very much for having this hearing today. I think I have been known for my brevity in the short time that I have been in the Senate. I don't plan on changing that.

I am going to introduce four nominees. I know that Senator Alexander—and I think this may be the first time I have ever spoken in front of him at any hearing or any meeting—he will have some comments. I know that each of them, when they are up here, would like to introduce some outstanding family members that they have with them.

It gives me great pride to be here. I thank you for having the hearing. I thank the President for filling this void on the TVA board. I know that you know this well, and the committee members do, the TVA is very important to the Tennessee Valley area. It spans multi-States, and it has multiple energy sources. It is very important to this country. So again, I thank the President for these nominees.

I have had the great privilege of knowing Bill Sansom and Barbara Haskew, two of the nominees, for many, many years, almost my entire adult life, and think very, very highly of both of them. I have had the great opportunity to meet Neil McBride and Marilyn Brown. I must tell you, their background and the things that they care about as it relates to TVA are most impressive. As a matter of fact these four candidates, these four nominees, each bring experiences to TVA which has multi-faceted operations that I hope is going to be very complementary to moving TVA ahead with the many issues that TVA and many utilities have to deal with today.

So with that, Chairman Boxer, I want to commend them to you. I hope that they will pass out of this committee and be confirmed by the Senate. And to each of them I want to say that I look forward to working with you on the many issues that TVA has to deal with. I thank you especially at this point in time in our country's history with all that we deal with in the public arena, I thank each of you for being willing to come forward and serve in this way. And again, hopefully right after confirmation I look forward to working with each of you.

Thank you, Chairman, for having this hearing and the flexibility that you have shown. I know this will be a very productive hearing, and I thank our esteemed senior Senator for allowing me for the first time ever to speak in front of him.

Senator BOXER. Well, he is a good guy.

Let me just say, I don't anticipate any bumps in the road. That is a report from you to me, and we are friends, and if I see any problems, I will let you know. So far, so good for everybody who has been nominated today. That is how it appears from what I can tell. So thank you.

Senator Alexander, the floor is yours.

OPENING STATEMENT OF HON. LAMAR ALEXANDER, U.S. SENATOR FROM THE STATE OF TENNESSEE

Senator ALEXANDER. Thank you, Madam Chair, and thanks to Senator Corker. It is traditional for home State Senators to introduce, as I would be down there if I weren't a member of the committee, nominees from their State. We have three from Tennessee. But Dr. Brown, who now is at Georgia Tech, had a long career at the Oak Ridge National Laboratory. We had a good visit the other day, and I am delighted to see here today as well. So while I am not her Senator today, I can certainly welcome here today, and I am glad to see her here.

Neil McBride, as Senator Corker said—I will let him introduce his family. He has had a long career in Tennessee, in environmental work, legal aid work. He has taught at the University of Tennessee, and I have enjoyed my visit with him prior to this hearing. Barbara Haskew and I have known each other a long time. She has a distinguished career at Middle Tennessee State University. She has been dean of the college, vice president and provost, which is a really hard job at a university. And she has a lot of experience with TVA itself in terms of its rate setting. I think she will be a valuable member of the board.

Bill Sansom has the distinction of having been nominated first by a Republican President and second by a Democratic President. That doesn't happen all that often. I think it is because he is known in our State as really not being a political person. Most of his work has been as things like chairman of the chamber of commerce and lay chairman of the board of the University of Tennessee and as a business leader and former chairman of TVA. I would like to put in the record, Madam Chair, a letter I received from the speaker emeritus, Jimmy Naifeh, of the Tennessee House of Representatives. Jimmy Naifeh is the Democratic leader and was speaker of the house for many, many years, worked with Mr. Sansom. I would like to include this letter in the record.

Senator BOXER. Without objection.

[The referenced information follows:]

Jimmy Naifeh
Speaker Emerius
G-19 A War Memorial Bldg.
Nashville, Tennessee 37243-0181
(615) 741-3774

House of Representatives
State of Tennessee
Nashville
Office of the Speaker Emeritus

Home Address
P.O. Box 97
Covington, Tennessee 38019
(901) 476-9598

December 9, 2009

The Honorable Lamar Alexander
United States Senate
SD 455 Dirksen Senate Office Building
Washington, DC 20510-4206

Dear Senator Alexander:

When I read the news about the TVA Board in the newspaper, I felt the need to write you concerning our good friend, Bill Sansom. Let me get right to what I am writing you about.

I was very glad to hear that President Obama was nominating Bill Sansom for another term on the TVA Board. I know that it pleased you also.

As you may or may not know, I know and respect Bill Sansom very much. I have known him as your Commissioner in Tennessee State Government, as a TVA Board member, through business and personally. I know him to be a man of honor and integrity with a great work ethic and simply just a good person.

What I am asking you is if there is anything I can do to help the process of Bill being confirmed by the U.S. Senate? I think he has done a great job on the TVA Board and as the Chairman.

I remember working with you when you were Governor as the House Majority Leader, and maintaining our good relationship as you have become our U.S. Senator. With this in mind, I am comfortable communicating about Bill Sansom with you.

Thanks for the great job you do as a public servant.

Sincerely,

Jimmy

Speaker Emeritus Jimmy Naifeh
TN House of Representatives

Lamar:
I hope you and
your family have
a great Christmas.
JN

Senator ALEXANDER. The Tennessee Valley Authority, there is no more important institution in our region, Madam Chairman, than the Tennessee Valley Authority. I saw it as Governor when one of the primary reasons why we were able to attract the automobile industry and other industries to Tennessee was because had large amounts of reliable, low cost electricity. I underline low cost. Today we would add the word clean to that. But large amounts of low cost, clean electricity. If there are any two words that I would like to emphasize to our nominees it would be low and cost. Because without those, the jobs go overseas, out of the country, looking for cheap energy.

I will wait until my time comes to ask some questions of the nominees. But just as one example, our current Governor, I am sure, would say virtually the same thing that I just said. He has just attracted three polysilicon plants to Tennessee, big manufacturing plants for solar power. But they each use 120 megawatts of electricity, and they wouldn't be in Tennessee if we didn't have large amount of low cost, reliable electricity today provided mostly by nuclear and coal.

TVA is the 16th cleanest utility in the country in terms of producing electricity that is free of pollution. That comes almost exclusively from about 33 percent nuclear power and 7 percent hydroelectric. So it is 40 percent carbon free, clean in that respect. And my hope is it can get much higher.

Thank you, Madam Chair, for holding the hearing, for your courtesy and being flexible today to make it possible for all this to happen in the midst of a snow storm.

Senator BOXER. Thank you very much.

What we are going to do now is ask our first panel to take their seats. Our first panel would be Arthur Elkins, Earl Gohl and Sandford Blitz. I am going to make an opening comment, and then whoever else would like to can do so. And we will get right to our nominees. When we finish this panel, we will go to our TVA. I have an opening statement for that, and others can do that as well and we will move to the panel. And with good fortune we should breeze through this pretty painlessly.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. The EPA is charged with protecting public health and the environment. Under our Nation's environmental laws it is a steward of our clean air, drinking water, lakes and rivers. The agency works to protect our children, our families and communities from hazardous waste, toxic chemicals and many other dangerous forms of pollution.

The EPA Inspector General, in my view, is EPA's conscience. The IG's duty is to ensure that EPA actions are free of waste, fraud and abuse. And any nomination, anybody nominated to serve in this position must meet a high standard for impartiality, integrity and independence.

Federal law requires that IGs be selected "without regard to political affiliation and solely on the basis of integrity and demonstrated ability in accounting, auditing, financial analysis, law, management analysis, public administration or investigations."

And Mr. Elkins, you fit that bill. I am going to ask that my statement be placed in the record in full.

But I want to say to you, Mr. Elkins, yours will be a tough, tough job and a vitally important one. And for anyone who truly believes in public service, it is rewarding work. Because what you do is going to impact our toxic waste clean ups whether or not we actually reduce pollution for our children and protect our people from cardiovascular, respiratory and other illnesses caused by pollution. Your work will make sure that our families have safe water to drink and clean lakes, rivers, and beaches to enjoy. These just aren't jobs with a benign job description. All of you here on this panel and the next one, you are really involved in so many important things to make life better for our people and make sure that you stand up for their rights at all times. That is what is so crucial.

Mr. Gohl, you have been nominated to be Federal Cochair of the Appalachian Regional Commission. We created this Commission to devise regional economic development initiatives involving Federal, State and local governments as well as community leaders. During these tough economic times the Commission needs a leader who is dedicated to providing opportunities for people to get back to work and for communities to reinvest in their economic future. We are very pleased that you have gotten this nomination.

Mr. Blitz, what more could I add to the two Senators from Maine? They made the case so eloquently, all I can say is if you are half as good as they say, then I think the Northeast is going to be rocking out of this recession and leading the way for the rest of the country.

So with that, I will put the rest of my statement into the record.

[The prepared statement of Senator Boxer follows:]

STATEMENT OF HON. BARBARA BOXER,
U.S. SENATOR FROM THE STATE OF CALIFORNIA

The Environmental Protection Agency (EPA) is charged with protecting public health and the environment under our Nation's environmental laws. EPA serves as the steward of our clean air, drinking water, lakes and rivers, and the agency works to protect our children, families and communities from hazardous waste, toxic chemicals and many other dangerous forms of pollution.

The EPA Inspector General is EPA's conscience. The IG's duty is to ensure that EPA's actions are free of waste, fraud and abuse. Any person nominated to serve in this position must meet a high standard for impartiality, integrity and independence.

Federal law requires IGs to be selected "without regard to political affiliation and solely on the basis of integrity and demonstrated ability in accounting, auditing, financial analysis, law, management analysis, public administration, or investigations."

For the past 16 years, Mr. Elkins has worked in public service, including as a public defender, prosecutor, counsel to the Inspector General of the National Science Foundation and as Associate General Counsel for EPA's General Law Office.

Mr. Elkins, this is a tough, tough job, but also a vitally important job—and I think for anyone who truly believes in public service, it can be extremely rewarding work.

If confirmed, you will provide EPA with information and recommendations that can help the Agency better achieve its goals of protecting public health and the environment. If confirmed, you can help the agency to achieve its mission to:

- Clean up more toxic waste sites to safeguard the health of our communities and to allow them to invest in redevelopment and jobs;
- Reduce air pollution so that our children do not suffer from asthma attacks and our people do not suffer from cardiovascular, respiratory, and other illnesses that are caused by pollution; and

- Ensure families have safe water to drink and clean lakes, rivers and beaches to enjoy.

The Office of Inspector General plays a key oversight role at the Agency, and this office is in need of strong leadership. I look forward to hearing from you today on how you will address these critical issues.

We also have Mr. Gohl before us today who has been nominated to be Federal Co-Chair of the Appalachian Regional Commission. Congress created the Commission to devise regional economic development initiatives involving Federal, State, and local governments, as well as community leaders.

During this tough economic time, the Commission needs a leader who is dedicated to providing opportunities for people to get back to work and for communities to reinvest in their economic future.

Mr. Blitz is also before us today and has been nominated to be the Federal Co-Chair of the Northern Border Regional Commission.

The Commission is an organization created to address the economic and community development challenges of the northern and most economically distressed counties of the States of Maine, New Hampshire, New York and Vermont.

The Federal Co-Chair of the Northern Border Regional Commission works with the Governors of those four States to identify needs and existing assets, develop economic and infrastructure strategies and make grants to support economic development. The Commission's purpose is to create and implement regional economic development plans to reduce poverty, address changing land use, and improve quality of life. The Commission's focus is on infrastructure, telecommunications, health care, transportation and energy.

I look forward to your testimony today.

Senator BOXER. Senator Alexander, do you have any further comments at this time?

Senator ALEXANDER. No, thank you, Madam Chair.

Senator BOXER. Senator Cardin.

Senator CARDIN. Just very briefly, Madam Chair. I don't want to trespass too much more on the time of our witnesses. I do want to talk just a moment about the Appalachian Regional Commission because it is critically important to the western part of my State. I do want to make two points, if I might. The Tri-County Council of Western Maryland has a long history of working hand in hand with the Appalachian Regional Commission. I encourage this partnership to continue, and I hope we will have a chance perhaps to talk about it.

The second thing I want to mention is the critically important economic priority for that region. It is the completion of the north-south highway alignment, Highway 219 and 220. It is a critical infrastructure for the entire region of West Virginia, Maryland and Pennsylvania. The improvement of these roads is estimated to create upwards of 12,000 new permanent jobs and 20,000 construction jobs in these affected States. It is not easy to find jobs in that part of our State, and that is exactly what the Appalachian Regional Commission's priorities should be about. I look forward to working with you, Mr. Gohl, as we develop a strategy.

I just want to mention one other thing that is important to Pennsylvania, not so much to Maryland. That is the prohibition on the use of toll credits to fund the project. Now, I know that is a legislative issue. But it would be helpful if the Commission would take a stand on that to help us complete the north-south highway. I just wanted to alert you to that at the beginning of this hearing because these are issues I will be questioning you on.

Thank you, Madam Chair, for your indulgence.

Senator BOXER. Thank you, Senator Cardin.

Senator Barrasso.

Senator BARRASSO. Thank you very much, Madam Chairman. I want to congratulate each of you; welcome you to the committee. I congratulate your families as well.

I would like to have a few comments, Madam Chairman, along the lines of what you mentioned, and specifically with regard to Mr. Elkins, who I congratulate and welcome to the committee. I would like to read to you, if I may, sir, a letter that Senator Inhofe and I sent to Lisa Jackson, the Administrator of the Environmental Protection Agency. We sent this October 15th. It says, "It has been nearly a year since the Administration has been in office. Over that time, the EPA has proposed a series of regulations to monitor and regulate greenhouses gases, which could cost millions of Americans their jobs. The process behind these regulations has raised many unanswered questions about how they were developed. We are concerned that not having a full-time EPA Inspector General appointed by the President and confirmed by the Senate fails to provide proper oversight of your agency's actions." The letter goes on to state that the President's delay in nominating an EPA Inspector General "fails to meet the Administration's objective to put a premium on transparency and openness." So despite the Administration's delay in getting a nomination to the Senate, I am glad that you are here today to visit with us, Mr. Elkins. The Inspector General at the EPA faces a daunting task, as our Chairman said. For more than a year the EPA has operated without this necessary oversight.

During that time Administration officials and some EPA officials have instructed individuals not to put information in writing, I presume in an effort to avoid public scrutiny of activity occurring behind the scenes at the EPA. They have attempted to publicly discredit a respected Small Business Administration attorney who dared to tell EPA that they had not followed proper procedures. And attempted to silence through intimidation and other means an internal critic who raised concerns about information the EPA was relying on to reach certain conclusions.

Now, EPA Administrator Lisa Jackson herself said on April 23rd of last year, "The success of our environmental efforts depends on earning and maintaining the trust of the public we serve." Trust in the EPA cannot be achieved without transparency and oversight. The Environmental Protection Agency is pursuing regulations and policies that I believe will cost millions of Americans' jobs.

The legality of the process that EPA has used to formulate the endangerment finding relating to carbon dioxide, which I might add is the greatest American job killing threat we have seen in decades, has been questioned by two Administration officials in under a year. I tried to investigate these matters as Ranking Member of the Subcommittee on Oversight of this committee. I have asked for investigation and hearings by the EPA and by the majority. The requests have been denied.

I believe it is time for a change. If this Administration or committee won't investigate these matters then you as the named Inspector General must act. The Administration has said that they want an EPA that is open and transparent, that differing views will be encouraged, that decisions will be based solely on science and that any individual will be made available to speak to Members of Congress without fear of reprisal.

I don't believe that the Administration has made the grade because they have been able to act without this accountability that you will provide. It is my hope that you will be able to bring the proper accountability and oversight that has been sorely missing. Once again, I thank you for being here to answer our questions, and I congratulate you on this new assignment.

Thank you, Madam Chairman.

Senator BOXER. Well, Mr. Elkins, since you have been thrown into now the middle of a very contentious issue, let me make it clear that our committee is quite divided on this point and that many of us believe that when the U.S. Supreme Court decided 5 to 4 that in fact greenhouse gas emissions were covered under the Clean Air Act, and they ordered the EPA to take a look at the endangerment situation, and if they found that in fact greenhouse gas endangers our people, they must act. And when in fact this EPA built on the EPA of George Bush, which had started all that work, and they came out with it, we had a lot of people saying uh-oh, now we are going to try a political attack. And that is what is going on. For 8 years, nothing was done because this case was in the court.

Now, where we come down now is we have several people, if not almost all, on the other side say that if we act, which this committee did act to write climate legislation, which has nothing to do, Mr. Elkins, with you, we write the laws, you have got to make sure they are carried out, OK? So this committee did act and did report a bill out. Now, my friend Senator Barrasso says the greatest job killer in the world. Well, we have three studies that just came out, one from Pew Charitable Trust, and we will put that in the record, one from U.C. Berkeley and the other from Next10, that says that the only job growth that has taken place during this recession has been clean energy jobs.

Now, that has nothing to do with your work. But politics has been thrown into the mix here, so we are going to get the debate out. But the fact is what we want you to do, I would trust both sides, is not come to this table with a political agenda of any sort. If you personally believe that standing up and battling greenhouse emissions, and if you agree with me, it is the greatest opportunity for clean energy jobs, it is a way to catch up with China, who is just cleaning our clocks with solar jobs, and wind turbine building and all the rest. If you agree with Senator Barrasso, it is the biggest jobs killer ever thought up by anybody, that is your opinion.

I don't care what your opinion is. I want you to follow the law and make sure that EPA is following the law. We don't need to make big speeches here on where we come down on the politics of it. That has nothing to do with you. But you need to look at what happened with the Supreme Court and whether or not our Administrator is following the law. And if you find that she is not following the law, you need to let us know. And if you find that she is, you need to let us know.

But I hope you will not get caught up one bit in this controversy that we have between the parties here on this committee. Because that is not your role. It would be inappropriate to do so.

We are going to now call on our nominees. Mr. Elkins, and each of you, if you have family here or friends, please feel free to introduce them. Because we are so grateful to them for lending you to us for a certain period of time.

So Mr. Elkins, go ahead.

[The referenced study follows:]

THE PEW CHARITABLE TRUSTS

The Clean Energy Economy
California

California has the largest clean energy economy of the 50 states. Jobs in this sector grew at a faster rate than total jobs in the Golden State between 1998 and 2007. California's clean energy economy has been driven by significant investment, attracting more than $6.5 billion in venture capital in the past three years. It also has been driven by public policies, from financial incentives for clean energy development and energy efficiency to renewable portfolio and energy efficiency standards. California's Green Building Action Plan—a goal for public buildings to be 20 percent more energy efficient by 2015—could save the state $100 million annually.[1]

BY THE NUMBERS, THE CLEAN ENERGY ECONOMY:

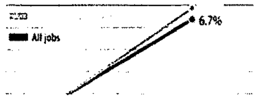
Jobs (2007): **125,390**
Businesses (2007): **10,209**
Venture Capital Funds (2006-2008)*: **$6,580,426,908**
Patents (1999-2008): **1,401**

STATUS OF CLEAN ENERGY ECONOMY

AVERAGE ANNUAL RATE OF

Average yearly rate of growth between 1998 and 2007

10-YEAR GROWTH



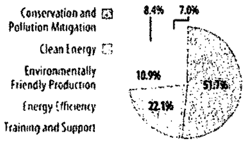
Relative rate of growth between 1998 and 2007

EXAMPLES OF COMPANIES:**

Bridgelux, *Sunnyvale* (Energy Efficiency): designs and manufactures LED lighting

Zpower, *Camarillo* (Clean Energy): designs and manufactures silver zinc batteries for next generation cell phones and computers (formerly known as Zinc Matrix Power)

JOB CATEGORIES***



Share of jobs in the clean energy economy by category

CLEAN ENERGY POLICIES

Financial Incentives****	●
Renewable Portfolio Standards	●
Energy Efficiency Resource Standards	●
Regional Cap and Trade Program	●

MORE ABOUT THESE FACTSHEETS

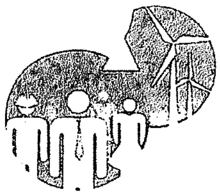
Download the full report by visiting www.pewtrusts.org/cleanenergyeconomy

NOTES: *Values reported in 2008 dollars. **Information current as of May 8, 2009. This report is intended for educational and informational purposes. References to specific products, services, companies and policy makers have been included solely to advance these purposes and do not constitute an endorsement, sponsorship or recommendation by The Pew Charitable Trusts. ***These numbers may not add up to 100 percent due to rounding. ****Financial incentives include residential, commercial and industrial loan financing, rebate programs and tax incentives.

SOURCES: Jobs and establishment data from The Pew Charitable Trusts, 2009; based on the National Establishment Time Series Database; analysis by Pew Center on the States and Collaborative Economics.
[1] State of California: Office of the Governor press release, "Executive Order S-20-04," December 14, 2004, http://gov.ca.gov/executive-order/3360/ (accessed May 13, 2009).

The Pew Charitable Trusts applies the power of knowledge to solve today's most challenging problems.
901 E Street NW | 10th Floor | Washington, DC 20004 | www.pewtrusts.org/cleanenergyeconomy

the CleanEnergy Economy



Repowering Jobs, Businesses and Investments Across America

THE
PEW
CHARITABLE TRUSTS

Executive Summary

America's clean energy economy is dawning as a critical component of the nation's future.

Research by The Pew Charitable Trusts shows that despite a lack of sustained policy attention and investment, the emerging clean energy economy has grown considerably—extending to all 50 states, engaging a wide variety of workers and generating new industries. Between 1998 and 2007, its jobs grew at a faster rate than overall jobs. Like all other sectors, the clean energy economy has been hit by the recession, but investments in clean technology have fared far better in the past year than venture capital overall. Looking forward, the clean energy economy has tremendous potential for growth, as investments continue to flow from both the government and private sector and federal and state policy makers increasingly push for reforms that will both spur economic renewal and sustain the environment.

By 2007, more than 68,200 businesses across all 50 states and the District of Columbia accounted for about 770,000 jobs that achieve the double bottom line of economic growth and environmental sustainability (Exhibit 1).

In today's tough financial climate, when millions of jobs have been lost, those numbers may sound modest. Three quarters of a million jobs represent half a percent of all jobs in the United States today. But Pew's research shows that between 1998 and 2007, clean energy economy jobs—a mix of white- and blue-collar positions, from scientists and engineers to electricians, machinists and teachers—grew by 9.1 percent, while total jobs grew by only 3.7 percent. And although we expect job growth in the clean energy economy to have declined in 2008, experts predict the drop in this sector will be less severe than the drop in U.S. jobs overall.

Pew's research indicates a strong start for a new economy still very much in its infancy. To put our clean energy economy numbers in perspective, consider the following. Biotechnology, which has developed applications for agriculture, consumer products, the environment and health care and has been the focus of significant public policy and government and private investment, employed fewer than 200,000 workers, or about a tenth of a percent of total U.S. jobs in 2007, according to a 2008 Ernst & Young report. And the well-established traditional energy sector—including utilities, coal mining and oil and gas extraction, industries that have received significant government investment—comprised about 1.27 million workers in 2007, or about 1 percent of total employment.

Growing attention and financial support from both the private and public sectors indicate that the clean energy economy is poised to expand significantly. Signaling interest in new market opportunities, venture capital investment in clean technology crossed the $1 billion threshold in 2005 and continued to grow substantially, totaling about $12.6 billion during the past three years. Although they have dropped significantly in recent months because of the recession, investments in clean technology are actually faring better than other industries: They were down 48 percent in the first three months of 2009 compared with a year earlier, while total venture capital across all sectors was down 61 percent for the same period. "It's important not to miss the forest for the trees," Nicholas Parker, executive chairman of the Cleantech Group, said in January 2009. "In 2008, there was a quantum leap in talent, resources and institutional appetite for clean technologies. Now, more than ever, clean technologies represent the biggest opportunities for job and wealth creation."

Between 2006 and 2008, 40 states and the District of Columbia attracted venture capital investments in technologies and industries aimed at economic growth and environmental sustainability. And all states will receive a major infusion of federal funds through the recently enacted American Recovery and Reinvestment Act (ARRA), which allocates nearly $85 billion in direct spending and tax incentives for energy- and transportation-related programs.

Every State Has a Piece of the Clean Energy Economy

With traditional manufacturing jobs declining during the past decade, states have been working aggressively to develop new industries and create jobs that will endure—and remain within U.S. borders. They also have been working to address the public's concerns about high energy prices, national security and our dependence on foreign oil, and global warming—all with an understanding that America is on its way to being a carbon-constrained country. "While our economic engine has for years been powered by relatively inexpensive energy, there is evidence that this era is coming to a close," a National Governors Association report noted in 2007. "Meanwhile, we are increasingly aware of the serious impacts of global climate change—and how America's consumption of fossil fuels is contributing to a warming Earth."

Pew's analysis shows that every state has a piece of America's clean energy economy. Texas, for instance, generates more electricity from wind than any other state, had more than 55,000 clean energy economy jobs in 2007, and attracted more than $716 million in venture capital funds for clean technology between 2006 and 2008. Tennessee has succeeded in cultivating jobs in recycling, waste treatment and water management, among other conservation industries; jobs in Tennessee's clean energy economy grew by more than 18 percent between 1998 and 2007, compared with 2.5 percent growth in all jobs in the state. Colorado has raised the amount of power electricity providers must supply from renewable energy sources to stimulate job growth in solar and wind power and other forms of clean energy generation. Ohio ranked among the top five states with the most jobs in clean energy, energy efficiency and environmentally friendly production in 2007. Idaho, Kansas, Mississippi and South Dakota are among more than a dozen states where the number of jobs in the clean energy economy in 2007 was modest, but the average annual growth rate of those jobs was among the highest in the country. All told, in 38 states and the District of Columbia, job growth in the clean energy economy outperformed total jobs growth between 1998 and 2007. In a number of states, job gains in the clean energy economy have helped lessen total job losses.

Defining the Clean Energy Economy

Pew partnered with Collaborative Economics, Inc., a public policy research firm based in California, on the research. While organizations on both sides of the political spectrum have weighed in with forecasts and economic modeling to estimate the size of the clean energy economy, Pew's analysis is the first of its kind to count actual jobs, businesses and investments for each of the 50 states and the District of Columbia. Our numbers are conservative and may be lower than some other reports for three reasons: First, we developed a stringent definition of the clean energy economy; second, we used a new, labor-intensive methodology that counted only companies that we could verify online as being actively engaged in the clean energy economy; and third, we counted businesses and jobs supplying products and services generated by the clean energy economy, not the companies using these products and services to make themselves "greener" (i.e., we counted only companies and jobs on the supply side, not the demand side, of the clean energy economy).

Policy makers, business leaders and the public need credible, reliable data to ground their policy deliberations and choices, and to understand where emerging economic opportunities lie. They also need a clear, concrete and common definition of what constitutes the clean energy economy so they can track jobs and businesses and gauge the effectiveness of public policy choices and investments.

Based on significant research and input from experts in the field, including the advisory panel that helped guide this study, Pew developed the following definition:

A clean energy economy generates jobs, businesses and investments while expanding clean energy production, increasing energy efficiency, reducing greenhouse gas emissions, waste and pollution, and conserving water and other natural resources.

The clean energy economy cuts across five categories: (1) Clean Energy; (2) Energy Efficiency; (3) Environmentally Friendly Production; (4) Conservation and Pollution Mitigation; and (5) Training and Support.

While specific jobs and businesses will change in the coming decades, the five categories of the clean energy economy will not—providing a clear, practical and consistent framework for federal, state and local policy makers and the private sector to track investments, job and business creation, and growth over time.

Jobs of Today, and Jobs of Tomorrow

Pew's framework takes into account that technology, scientific research, market forces and public policy will continue to drive innovation and competition, so the largest segments of today's clean energy economy may not be its driving forces tomorrow.

Our data show that 65 percent of today's clean energy economy jobs are in the category of Conservation and Pollution Mitigation—a sector that reflects the growing recognition among the public, policy makers and business leaders of the need to recycle waste, conserve water and mitigate emissions of greenhouse gases and other pollutants. But three other categories—Clean Energy, Energy Efficiency and Environmentally Friendly Production—are growing at a far faster clip. And about 80 percent of venture capital investments in 2008 were in the sectors of Clean Energy and Energy Efficiency: businesses and jobs working to develop clean, renewable energy sources such as wind and solar and products and services that reduce our overall energy consumption—all of which will help meet the demands of a carbon-constrained economy.

The flow of venture capital indicates which sectors are most attractive to investors and have the greatest growth potential. The number of jobs and businesses in Clean Energy and Energy Efficiency will grow over time—and as the country increases the amount of power it draws from renewable sources, we will generate less waste, reduce our reliance on foreign oil and produce fewer carbon emissions that cause global warming. That does not mean that jobs in the Conservation and Pollution Mitigation category will disappear. As other countries seek to follow America's lead, they increasingly will need help managing their finite natural resources and addressing the adverse effects of their use of fossil-fuel energy sources—creating a new market for our products, technology and know-how.

Public Policy's Role in Driving the Clean Energy Economy

Public policy is another important indicator of the future of the clean energy economy.

Policies intended to advance the clean energy economy—from comprehensive energy plans, renewable energy standards and energy efficiency measures to the development of alternative fuels, job retraining and waste reduction efforts—have been adopted or are being actively considered by both the federal government and states. It is too early to tell to what degree these efforts will succeed in stimulating U.S. job growth, strengthening America's competitiveness, curbing pollution and conserving resources. But Pew's analysis indicates such policies have great potential because they create significant incentives for both the private and public sectors to develop new technologies, infrastructure and processes for clean energy, efficiency and conservation. Now that we have baseline data in hand, Pew will conduct follow-up research to assess which approaches are particularly effective in generating jobs, businesses and investments in the clean energy economy.

State policies. Governors and legislators across the country are seeking to get to the double bottom line of economic growth and environmental sustainability by adopting policies to advance the clean energy economy.

- *Financial incentives.* Forty-six states offer some form of tax incentive to encourage corporations and residents to use renewable energy or adopt energy efficiency systems and equipment. Thirty-three states provide residential, commercial and industrial loan financing for the purchase of renewable energy or energy efficiency systems or equipment. And 22 states and the District of Columbia offer rebate programs to promote the installation of solar water heating or solar panels for electricity generation.
- *Renewable portfolio standards.* Twenty-nine states and the District of Columbia have adopted renewable portfolio standards, which require electricity providers to supply a minimum amount of power from renewable energy sources.
- *Energy efficiency standards.* Nineteen states have established energy efficiency standards for energy generation, transmission and use.

- *Regional clean energy initiatives.* Twenty-three states are participating in three major regional initiatives seeking to increase renewable energy generation and reduce carbon pollution from power plants that causes global warming.
- *Vehicle emissions standards.* Fourteen states and the District of Columbia have adopted (and three more states are poised to adopt) California's vehicle emissions standards, which allow states the right to require automakers to reduce carbon emissions from new cars and light trucks more aggressively than federal standards mandate. On May 19, 2009, President Barack Obama established national limits on vehicle emissions by adopting fuel efficiency standards that match California's.

Federal policies. The federal government also has played a critical role, adopting policies and making investments that have spurred economic growth and environmental protection from coast to coast. Laws enacted in the 1960s and 1970s helped develop the recycling, waste reduction and waste management industries. The EPA's Energy Star and Water Sense certification and labeling initiatives long have helped consumers choose and use products that conserve energy and water. And for almost two decades, the U.S. Department of Commerce has helped manufacturers improve efficiency, reduce waste and develop clean technologies and products.

In the last three years, federal policy makers have taken major steps to drive the clean energy economy forward. President Obama's recent efforts to enact stronger fuel efficiency standards built on earlier legislation. In 2007, President George W. Bush signed into law the first congressionally mandated increase in fuel efficiency standards for cars and light trucks in more than 30 years. The Energy Independence and Security Act of 2007 is projected to save consumers $25 billion at the gas pump, save 1.1 million barrels of oil a day and reduce greenhouse gas emissions.

Enacted in February 2009, ARRA—the federal stimulus bill—includes an array of provisions to spur clean energy generation and energy efficiency businesses, jobs and investments. Among the almost $85 billion the package allocates to energy- and transportation-related spending, about $21 billion is dedicated to extending tax incentives for wind, solar and other renewable energy manufacturers. ARRA also provides more than $30 billion for direct spending on clean energy programs, including $11 billion to modernize the nation's electricity grid; $2 billion for advanced battery technology; more than $6 billion for state and local efforts to achieve energy efficiency; $5 billion for weatherization of low-income homes; $500 million for job training to help workers participate in the clean energy economy; and $300 million to purchase thousands of new, fuel-efficient vehicles for the federal fleet from American auto companies.

Moving forward. Given America's need to create enduring jobs and industries while conserving natural resources and reducing carbon emissions, federal leaders are deliberating additional measures to spur the clean energy economy.

President Obama has signaled his support for a federal clean energy plan to reduce greenhouse gas emissions by at least 80 percent by 2050, and a national renewable portfolio standard that would require that 25 percent of the nation's energy supply be derived from renewable sources by 2025. At this writing, the U.S. House of Representatives is considering the American Clean Energy and Security Act, a market-based proposal that would limit overall greenhouse gas emissions and distribute tradable federal allowances for each ton of pollution emitted. The program would apply to electric utilities, oil companies and other entities that produce more than 25,000 tons of carbon dioxide each year. The bill would increase significantly the amount of energy derived from low- or zero-carbon sources, including renewables—meaning that businesses and jobs would be generated to develop clean energy sources to meet the demand.

EXHIBIT 1

THE U.S. CLEAN ENERGY ECONOMY BY THE NUMBERS

By 2007, 68,203 businesses in the United States had generated more than 770,000 jobs in the clean energy economy. And between 2006 and 2008, about $12.6 billion of venture capital investments was directed toward clean technology businesses in 40 states and the District of Columbia. The U.S. clean energy economy is an emerging source of jobs that achieve the double bottom line of economic growth and environmental sustainability. Every state has a piece of America's clean energy economy.

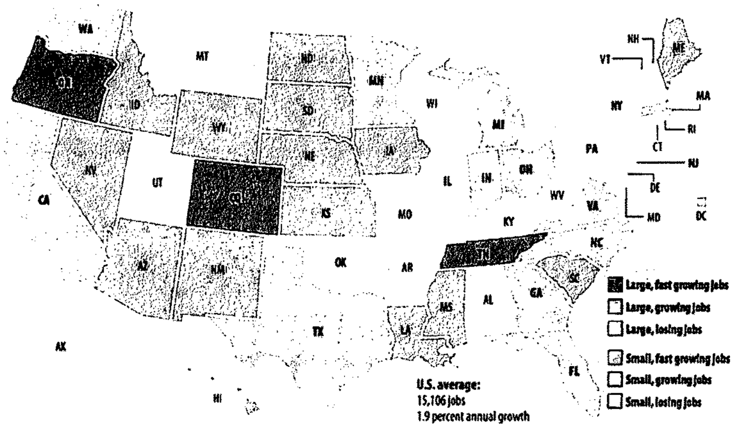
	CLEAN BUSINESSES 2007	CLEAN JOBS 2007	CLEAN JOB GROWTH 1998-2007	OVERALL JOB GROWTH 1998-2007	VENTURE CAPITAL 2006-2008 (thousands)
Alabama	799	7,849	2.2%	1.6%	$0
Alaska	350	2,140	9.4	15.7	0
Arizona	1,123	11,578	21.3	16.2	31,106
Arkansas	448	4,597	7.8	3.5	22,845
California	10,209	125,390	7.7	6.7	6,580,427
Colorado	1,778	17,008	18.2	8.2	622,401
Connecticut	857	10,147	7.0	-2.7	30,050
Delaware	211	2,368	-2.3	-8.9	3,342
District of Columbia	280	5,325	18.8	-7.1	89,877
Florida	3,831	31,122	7.9	22.4	116,980
Georgia	1,827	16,222	10.8	15.7	179,686
Hawaii	356	2,732	43.6	7.3	12,304
Idaho	428	4,517	126.1	13.8	27,890
Illinois	2,176	28,395	-2.5	-2.5	108,519
Indiana	1,268	17,298	17.9	-1.0	26,000
Iowa	729	7,702	26.1	3.6	149,237
Kansas	591	8,017	51.0	-0.3	13,275
Kentucky	778	9,308	10.0	3.6	0
Louisiana	995	10,641	19.5	3.0	0
Maine	725	6,000	22.7	3.3	0
Maryland	1,145	12,908	-2.4	1.3	323,996
Massachusetts	1,912	26,678	4.3	-4.4	1,278,462
Michigan	1,932	22,674	10.7	-3.6	55,099
Minnesota	1,206	19,994	11.9	1.9	49,938
Mississippi	454	3,200	24.8	3.6	30,384
Missouri	1,062	11,714	5.4	2.1	24,480
Montana	408	2,155	0.2%	12.7%	$0
Nebraska	368	5,292	108.6	-4.9	0
Nevada	511	3,641	28.8	26.5	19,804
New Hampshire	465	4,029	2.0	6.8	66,917
New Jersey	2,031	25,397	-9.6	-2.7	282,568
New Mexico	577	4,815	50.1	1.9	147,913
New York	3,323	34,363	-1.9	-2.6	209,590
North Carolina	1,783	16,997	15.3	6.4	82,571
North Dakota	137	2,112	30.9	9.4	0
Ohio	2,513	35,267	7.3	-2.2	74,224
Oklahoma	693	5,465	6.8	2.4	5,192
Oregon	1,613	19,340	50.7	7.5	70,002
Pennsylvania	2,934	38,763	-6.2	-3.1	232,897
Rhode Island	237	2,328	0.7	0.6	22,845
South Carolina	884	11,255	36.2	2.2	0
South Dakota	169	1,636	93.4	4.9	0
Tennessee	1,090	15,507	18.2	2.5	16,329
Texas	4,802	55,646	15.5	6.7	716,894
Utah	579	5,199	-12.4	10.8	26,957
Vermont	311	2,161	15.3	7.4	53,747
Virginia	1,446	16,907	6.0	6.6	70,828
Washington	2,008	17,013	0.5	1.3	635,109
West Virginia	332	3,065	-4.1	0.7	5,741
Wisconsin	1,294	15,089	-5.2	3.4	46,743
Wyoming	225	1,419	56.4	14.0	6,942
U.S. Total	68,203	770,385	9.1	3.7	12,570,110

NOTE: Venture capital values are adjusted for inflation and reported in 2008 dollars. See appendices for the complete data sets.
SOURCE: Pew Charitable Trusts, 2009, based on the National Establishment Time Series Database and data from the Cleantech Group™ LLC; analysis by the Pew Center on the States and Collaborative Economics

EXHIBIT 10

WHERE ARE THE JOBS IN THE CLEAN ENERGY ECONOMY?

Looking simultaneously at the total number of jobs (large or small) and their average annual growth rate (fast growing, growing or losing), states' clean energy economies fall into six groups: large and fast-growing jobs, growing jobs or losing jobs; and small and fast-growing jobs, growing jobs or losing jobs. Large states had more jobs in their clean energy economies in 2007 than the national average of 15,106 jobs. Small states had fewer than the national average of clean energy economy jobs. States with fast-growing clean energy economies experienced average annual growth between 1998 and 2007 that exceeded the national average of 1.9 percent. Growing states had a positive average annual rate of growth less than 1.9 percent and losing states have experienced negative growth.



U.S. average:
15,106 jobs
1.9 percent annual growth

STATE	TOTAL CLEAN JOBS 2007	AVG. ANNUAL GROWTH 1998-2007	STATE	TOTAL CLEAN JOBS 2007	AVG. ANNUAL GROWTH 1998-2007	STATE	TOTAL CLEAN JOBS 2007	AVG. ANNUAL GROWTH 1998-2007
Alabama	7,849	0.31%	Kentucky	9,308	1.09%	North Dakota	2,112	3.17%
Alaska	2,140	1.14	Louisiana	10,641	2.06	Ohio	35,267	0.85
Arizona	11,578	2.19	Maine	6,000	2.34	Oklahoma	5,465	0.89
Arkansas	4,597	0.99	Maryland	12,908	−0.11	Oregon	19,340	4.77
California	125,390	0.88	Massachusetts	26,678	0.52	Pennsylvania	38,763	−0.48
Colorado	17,008	1.98	Michigan	22,674	1.20	Rhode Island	2,328	0.37
Connecticut	10,147	1.11	Minnesota	19,994	1.38	South Carolina	11,255	3.56
Delaware	2,368	0.23	Mississippi	3,200	2.57	South Dakota	1,636	7.89
District of Columbia	5,325	2.13	Missouri	11,714	0.71	Tennessee	15,507	2.14
Florida	31,122	0.90	Montana	2,155	0.15	Texas	55,646	1.70
Georgia	16,222	1.18	Nebraska	5,292	10.00	Utah	5,199	−1.31
Hawaii	2,732	4.29	Nevada	3,641	3.15	Vermont	2,161	1.69
Idaho	4,517	10.11	New Hampshire	4,029	0.44	Virginia	16,907	0.66
Illinois	28,395	−0.25	New Jersey	25,397	−1.08	Washington	17,013	0.23
Indiana	17,298	1.88	New Mexico	4,815	4.73	West Virginia	3,065	−0.36
Iowa	7,702	2.66	New York	34,363	−0.14	Wisconsin	15,089	−0.55
Kansas	8,017	4.74	North Carolina	16,997	1.62	Wyoming	1,419	5.16

SOURCE: Pew Charitable Trusts, 2009, based on the National Establishment Time Series Database; analysis by Pew Center on the States and Collaborative Economics.

EXHIBIT 11

STATE LEADERS IN JOBS ACROSS THE CLEAN ENERGY ECONOMY BY CATEGORY

Although California leads in overall employment in each category, a closer look reveals other notable trends. Arizona makes the top 10 in Clean Energy but in no other category. Massachusetts, New York and Ohio are among the top 10 in all but one category.

While Arizona, Arkansas, Iowa, Maine, Nebraska, Wisconsin and the District of Columbia each have fewer than 15,106 jobs in the clean energy economy—the national average—they rank among the top 10 states in one of the five categories. In all, nearly half the states rank among at least the top 10 states in at least one category of the clean energy economy.

Clean Energy	JOBS 2007	Energy Efficiency	JOBS 2007	Environmentally Friendly Production	JOBS 2007	Conservation and Pollution Mitigation	JOBS 2007	Training and Support	JOBS 2007
California	27,672	California	10,510	California	13,666	California	64,799	California	8,743
Pennsylvania	10,099	Texas	6,353	Minnesota	3,815	Texas	40,617	New York	3,499
Minnesota	4,030	Ohio	5,367	Oregon	3,304	Pennsylvania	24,703	Illinois	3,216
Ohio	3,653	Oregon	4,893	Ohio	2,800	Florida	24,686	Massachusetts	3,155
Texas	3,479	New York	3,311	Iowa	2,237	New York	23,082	District of Columbia	3,130
New York	3,421	Wisconsin	2,801	Texas	2,223	Ohio	22,296	Texas	2,974
Michigan	2,941	Maine	2,560	Nebraska	2,162	New Jersey	20,060	Florida	2,249
Massachusetts	2,890	Massachusetts	2,553	Illinois	1,921	Illinois	19,631	Virginia	1,755
District of Columbia	2,728	Virginia	2,135	Colorado	1,361	Massachusetts	17,374	Pennsylvania	1,742
Colorado	2,639	Florida	2,071	Arkansas	1,303	Michigan	15,852	North Carolina	1,659

SOURCE: Pew Charitable Trusts, 2009, based on the National Establishment Time Series Database; analysis by Pew Center on the States and Collaborative Economics.

economy as of that year, it was a close second with 0.85 of its overall jobs dedicated to the clean energy economy. At the other end of the spectrum, 0.24 percent of Mississippi's total jobs were part of the clean energy economy in 2007, although the state's number of jobs in this area was growing.

Analysis Three: Growth of Jobs in the Clean Energy Economy Compared with Overall Jobs Growth

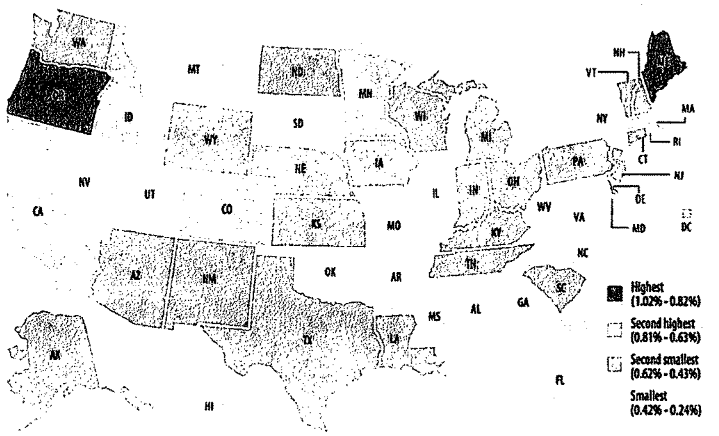
Nationally, jobs in the clean energy economy grew by an average of 1 percent annually during the past 10 years, while total employment grew by an average of 0.4 percent annually. In 38 states and the District of Columbia, job growth in the clean energy economy outperformed total job growth between 1998 and 2007. In a number of states, job gains in the clean energy economy have helped lessen total job losses.

Job growth in the clean energy economy eclipsed growth for all jobs by more than 2 percent in 11 states: Hawaii, Idaho, Iowa, Kansas, Mississippi, New Mexico, North Dakota, Oregon, South Carolina, South Dakota and Wyoming. Oregon's large and fast-growing clean energy economy, for example, has dwarfed the growth of overall jobs in the state, expanding by an average of 4.8 percent compared with an average of less than 1 percent annually. This growth is not limited to one industry or job type: Oregon's jobs in the clean energy economy have experienced marked growth during the past 10 years in all five of Pew's categories. And although North and South Dakota have very small clean energy economies, the growth of these jobs in both states has outpaced their growth of total jobs. In North Dakota, overall jobs grew by 1.0 percent, but jobs in the clean energy economy grew by an average of 3.2 percent. In South Dakota, overall jobs grew by

EXHIBIT 12

CLEAN ENERGY ECONOMIES AS A SHARE OF STATES' OVERALL ECONOMIES

It is important for states to know just how many of their total jobs fall within the clean energy economy. Nationally, jobs in the clean energy economy accounted for 0.49 percent of all jobs in 2007; 22 states exceeded that national average.



	TOTAL JOBS	PERCENT CLEAN		TOTAL JOBS	PERCENT CLEAN		TOTAL JOBS	PERCENT CLEAN
Alabama	2,193,589	0.36%	Kentucky	2,069,602	0.45%	North Dakota	422,054	0.50%
Alaska	388,361	0.55	Louisiana	2,326,888	0.46	Ohio	6,304,302	0.56
Arizona	2,661,437	0.44	Maine	707,195	0.85	Oklahoma	1,784,492	0.31
Arkansas	1,366,809	0.34	Maryland	3,108,256	0.42	Oregon	1,902,294	1.02
California	17,556,872	0.71	Massachusetts	3,870,356	0.69	Pennsylvania	6,542,137	0.59
Colorado	2,668,069	0.64	Michigan	5,279,234	0.43	Rhode Island	549,754	0.42
Connecticut	2,150,723	0.47	Minnesota	3,143,012	0.64	South Carolina	2,059,151	0.55
Delaware	502,773	0.47	Mississippi	1,356,603	0.24	South Dakota	444,659	0.37
District of Columbia	1,021,958	0.52	Missouri	3,178,657	0.37	Tennessee	3,144,614	0.49
Florida	9,903,922	0.31	Montana	512,093	0.42	Texas	11,726,811	0.47
Georgia	4,955,677	0.33	Nebraska	1,038,673	0.51	Utah	1,291,211	0.40
Hawaii	651,894	0.42	Nevada	1,280,532	0.28	Vermont	365,646	0.59
Idaho	718,373	0.63	New Hampshire	735,051	0.55	Virginia	4,238,337	0.40
Illinois	6,792,326	0.42	New Jersey	4,957,892	0.51	Washington	3,098,042	0.55
Indiana	3,348,351	0.52	New Mexico	970,632	0.50	West Virginia	792,474	0.39
Iowa	1,800,264	0.43	New York	9,964,700	0.34	Wisconsin	3,150,000	0.48
Kansas	1,531,164	0.52	North Carolina	4,629,118	0.37	Wyoming	302,245	0.47

SOURCE: Pew Charitable Trusts, 2009, based on the National Establishment Time Series Database; analysis by Pew Center on the States and Collaborative Economics.

of Columbia have had at least one registered clean technology patent in the past 10 years. Exhibit 15 shows the 10 states with the highest number of patent registrations from 1999 to 2008. See Appendix E for the 50-state table.

EXHIBIT 14 VENTURE CAPITAL INVESTMENTS

Top 10 states attracting venture capital investments in companies in the clean energy economy, 2006-2008. In millions.

California	$6,580
Massachusetts	1,278
Texas	717
Washington	635
Colorado	622
Maryland	324
New Jersey	283
Pennsylvania	233
New York	210
Georgia	180

NOTE: Investment values are adjusted for inflation, reported in 2008 dollars and rounded to the nearest $1,000,000.

SOURCE: Pew Charitable Trusts, 2009, based on data from The Cleantech Group™ LLC; analysis by Pew Center on the States and Collaborative Economics.

EXHIBIT 15 CLEAN TECHNOLOGY PATENTS

Top 10 states in clean technology patent registrations 1999-2008

California	1,401
New York	909
Michigan	749
Texas	414
Connecticut	404
Massachusetts	384
Ohio	309
Illinois	297
Georgia	256
New Jersey	248

SOURCE: Pew Charitable Trusts, 2009, based on data from 1790 Analytics, analysis by Pew Center on the States and Collaborative Economics.

CONTACT

Cater Communications: 415-453-0430 or 323-939-5015

CALIFORNIA GREEN TECH INVESTMENT, PATENTS, JOBS JUMP

New Report Documents Powerful Economic Stimulus of Energy Efficiency

Los Angeles, CA – New statistics to be released today in the 2009 "*California Green Innovation Index*" document the powerful economic stimulus provided by energy efficiency and green technology in California, despite the worldwide financial crisis. The Index finds that total Gross Domestic Product (GDP) produced per unit of energy (energy productivity) is 68 percent higher in California than the rest of the nation, which generates billions for the economy. Since 2005 statewide green jobs have grown at a rate ten times faster than total job growth. Green tech venture capital investment nearly doubled in one year, hitting an all-time high of $3.3 billion in 2008, capturing 57 percent of the national total. Los Angeles, San Francisco and Sacramento together accounted for over 20 percent of the nation's hybrid vehicle registrations in 2007.

"As the country moves quickly to put an economic stimulus package in place, California's experience with energy efficiency and clean technology is instructive," said F. Noel Perry, venture capitalist and founder of the nonpartisan, nonprofit Next 10. "If California had not moved as forcefully to decrease energy consumption over the last three decades, we would be in a much more precarious economic position right now. Imagine where the country could be if it were as efficient as California."

The 2009 California Green Innovation Index, an initiative from Next 10 and authored by Collaborative Economics, will be unveiled at the VerdeXchange Conference in Los Angeles--a leading technology, energy, and regulatory "green marketmakers" event. Designed to track key economic, energy and environmental indicators, the Index provides critical data on the impact of innovation on the state's economic and environmental health as California moves to reduce greenhouse gas (GHG) emissions to 1990 levels as mandated by the California Global Warming Solutions Act (AB 32). A PDF of the Index can be found at: http://www.next10.org/environment/greenInnovation09.html.

The 2009 Index includes never before published data on green businesses and jobs, providing the most comprehensive accounting of this growing area of economic activity. Importantly, this is a bottom-up accounting based on empirical evidence and not statistical modeling. Also unique to this Index is the green patent registrations analysis produced in cooperation with 1790 Analytics (based on data from the U.S. Patent and Trade Office).

Chief among Index findings:

- From 2002-07, California led all states in patent registrations for green technologies, increasing the state's total number by 70 percent over a similar period in the early nineties. (page 31)
- Despite slowing in overall venture capital investment, clean technology investment in California hit an all-time high in 2008 of $3.3 billion, increasing nearly $1.5 billion over 2007 and over seven times total clean tech investment in 2005. (page 28)
- Since 2005, green job growth has grown by 10 percent, while statewide jobs have increased by only 1 percent. By green segment, job growth has been strongest in Advanced Materials (28 percent) followed by Transportation (23 percent), Air & Environment (22 percent), and Green Building (20 percent), with 20 percent of those jobs generated in manufacturing. (pages 70 and 71)
- Over 1.5 million jobs have been created as a result of energy efficiency policies forged by California over the last 35 years, generating $45 billion in payroll. (page 66)

- California's energy productivity is 68 percent higher than that of the rest of the country. Measured as the ratio of energy consumed (inputs) to GDP (economic output), growth in energy productivity equates to more dollars of GDP generated per unit of energy consumed. (page 21)
- Nationally, California is the top-ranking state in alternative fuel vehicle (AFV) registrations (excluding Flex Fuel Vehicles) with the number of newly registered AFVs more than four times higher than any other state. However, according to most recent data, the United States as a whole had a higher average fuel economy of passenger vehicles (20.1 mpg) than California (19.9 mpg) in 2006. (pages 44-46)
- In 2007, three of the top ten hybrid metropolitan markets were in California; Los Angeles (#1), San Francisco (#2), and Sacramento (#9) metropolitan areas accounted for over 20 percent of new hybrid registrations in the U.S. (page 46)
- Power generation from renewable sources increased by 19 percent in California from 2002-2007, while total energy generation grew by only 11 percent. Since 2003, the wind power generated for California increased 95 percent. (pages 52 and 53)
- Since 2001, vehicle miles traveled (VMT) per capita in California dropped 2 percent with half of this progress achieved between 2006 and 2007 alone. During this same time period, VMT per capita in the rest of the nation increased 3 percent. Relative to 2002, while gasoline prices in 2008 climbed 92 percent higher, total California sales dropped back to 2002 levels and gasoline sales per capita dropped 10 percent. (page 39)
- California increased grid-connected photovoltaic (PV) solar capacity by 41 percent from 2006 to 2007. (page 55)
- Public transportation expanded 22 percent from 2005-06, adding over 100.5 million transit service miles.

Trends identified in the 2008 Index that continued in the 2009 Index include:

- Californians, per capita, pay lower utility bills and spend billions less of their state economy as a whole on electricity than the rest of the country due to energy efficiency innovation.
- California's Carbon Economy continues a gradual downward trend in the direction of a carbon-free economy, delinking economic growth from GHG emissions. While GDP per capita has increased by 28 percent in 16 years (1990-2006) gross emission per capita are 10 percent lower than in 1990.
- The average monthly residential electricity bill in California is less than half of the average monthly bill in Texas, representing a total savings for Californians of nearly $25 billion in 2007. As a fraction of the state economy, Texas' overall electricity bill is almost double California's bill.

According to annual Field Poll results included in the Index, despite bleak economic times, seven in ten registered voters believe global warming poses a serious threat to both the economy (69 percent) and overall quality of life (73 percent). In fact, according to California voters, who were polled during the height of September's bank failures, 74 percent believe it is possible to reduce GHG emissions while creating jobs and building economic prosperity.

Though many of the 2009 Index findings confirm continued progress in economic, energy and environmental indicators, major indices underscore the difficult challenges ahead:

- Even while per capita VMT and emissions have scaled back to 1995 levels, total VMT and total transportation GHG emissions have increased 20 percent since that year.
- While slowing in growth since 2001, total GHG emissions in California continued to rise by 4 percent from 2003-2006.
- Total electricity consumption in California continues to rise, though 2006-2007 represents the smallest annual increase since 2002.

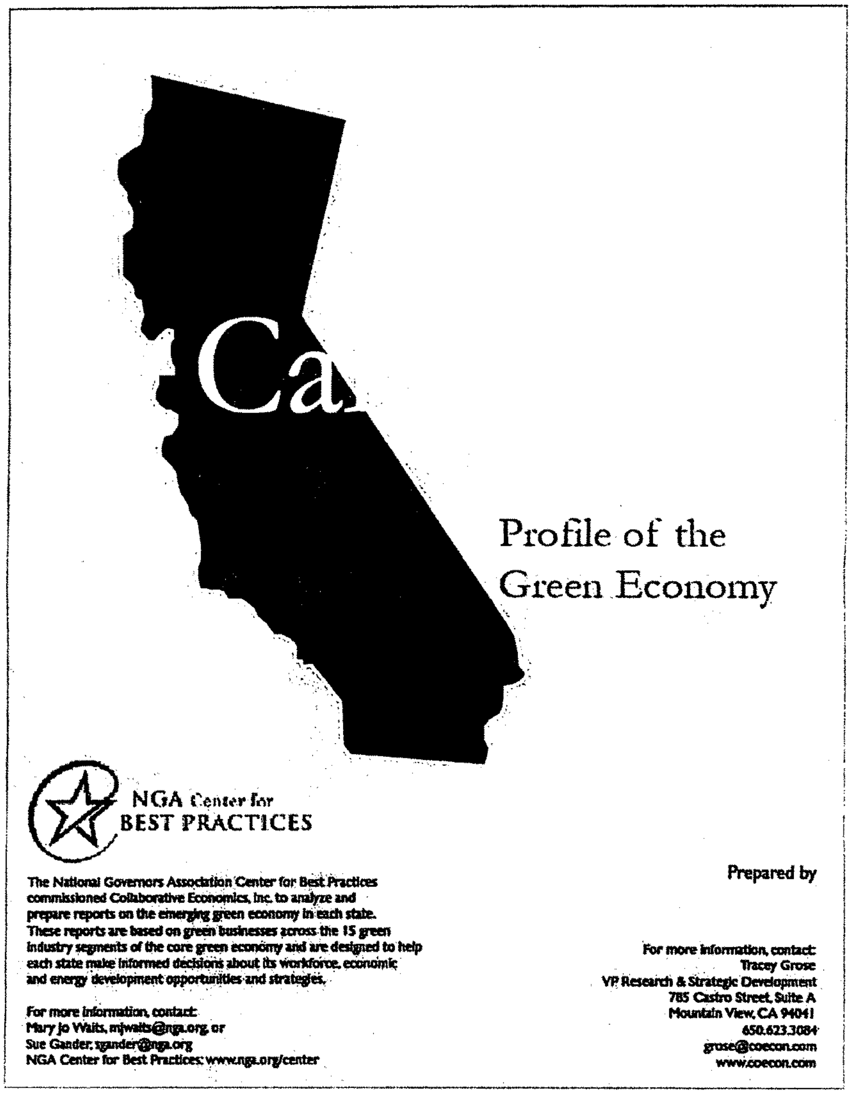
- Commercial electricity consumption continues to rise, increasing overall from 2004-2005 by 3 percent, and per square foot by 1 percent. Large-scale data centers, or server farms, are not included in this number.
- The number of working Californians using alternatives to driving alone has remained fairly static between 26 and 28 percent since 2000.

"California, like the rest of the nation and world, is caught in a financial perfect storm at the same time it has committed to dramatic reductions in global warming emissions," said Doug Henton of Collaborative Economics, a Silicon Valley-based firm that prepared the Index for Next 10. "Interestingly, this Index provides evidence that moving to cleaner and more efficient energy use must be part of the economic solution."

The Index was produced in partnership with Collaborative Economics, a Mountain View, California-based research and consulting organization that works with senior executives from business, foundations, government, education and community sectors to identify economic, environmental and social trends and promote regional innovation. For over a decade, Collaborative Economics has prepared the annual Index of Silicon Valley for Joint Venture: Silicon Valley Network.

Next 10 is an independent, nonpartisan organization that educates, engages and empowers Californians to improve the state's future. Next 10 is focused on innovation and the intersection between the economy, the environment, and quality of life issues for all Californians. Next 10 employs research from leading experts on complex state issues and creates a portfolio of nonpartisan educational materials to foster a deeper understanding of the critical issues affecting our state.

-End-



Ca

Profile of the
Green Economy

NGA Center for
BEST PRACTICES

The National Governors Association Center for Best Practices commissioned Collaborative Economics, Inc. to analyze and prepare reports on the emerging green economy in each state. These reports are based on green businesses across the 15 green industry segments of the core green economy and are designed to help each state make informed decisions about its workforce, economic and energy development opportunities and strategies.

For more information, contact:
Mary Jo Waits, mjwaits@nga.org, or
Sue Gander, sgander@nga.org
NGA Center for Best Practices: www.nga.org/center

Prepared by

For more information, contact:
Tracey Grose
VP Research & Strategic Development
785 Castro Street, Suite A
Mountain View, CA 94041
650.623.3084
grose@coecon.com
www.coecon.com

CALIFORNIA'S GREEN ECONOMY SUMMARY

The emerging green economy is diverse and widespread. To varying degrees, every state is witnessing growth in some green industry segment, and more often than not, this business growth is building off of existing strengths in the state. Familiar products and services are finding new uses or are taking new forms in response to new market demands. As policy makers implement new standards (e.g. building effiency standards, renewable portfolio standard), incentives and regulations, new business opportunities emerge to meet growing demand.

Analyzing a state's green economy in terms of the scope of green business activity can reveal areas of comparative advantage, promising areas for R&D investment and workforce development, and opportunities for building partnerships within and across green industry segments. Additionally, as incentives and new regulations are introduced, this information reveals the extent of a state's business base for meeting the coming demand for things such as highly efficiency appliances, renewable energy generation systems, high-efficiency building products, and low-emission fuels.

This analysis examines core green business activity and focuses on businesses that provide products and services that do the following:[1]

- Provide alternatives to carbon-based energy sources
- Conserve the use of energy and all natural resources
- Reduce pollution (including GHG emissions) and repurpose waste.

In addition, this summary provides an initial view into innovation in the fields of clean and green technology. State trends in venture capital investment and patent registrations can provide some indication for areas of future business activity.

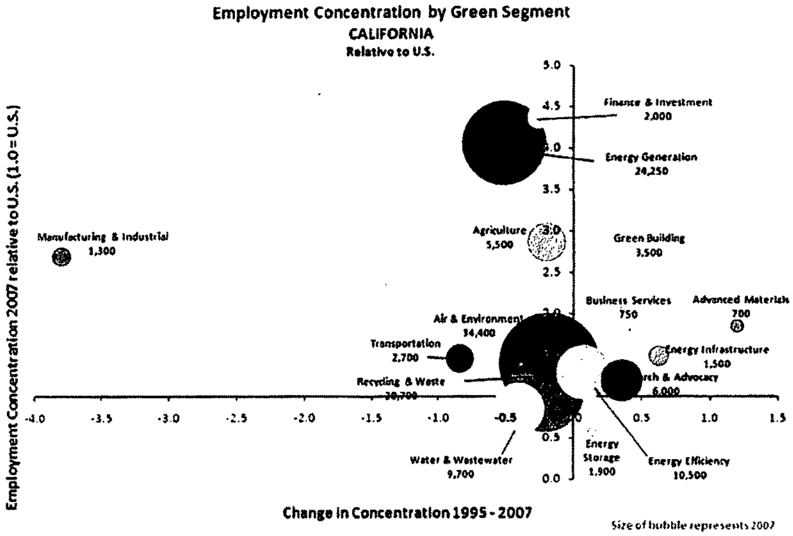
Green Business Activity

California's green economy displays a diverse array of green businesses with different levels of specialization. California has long been a leader in green industry, and is clearly a national leader in Energy Generation and Finance & Investment (see Employment Concentration by Green Segment graph, commonly called a "bubble chart"). Other areas of growing comparative advantage are in Advanced Materials, Business Services, Energy Efficiency, Energy Infrastructure, and Research & Advocacy.

Each "bubble" represents one of the 15 green segments, and its size represents the **employment size.**[2] (The segments are described in a detailed table below.) With more than 34,000 jobs, Air & Environment accounts for approximately 28 percent of employment in California's green segments, while California's 24,000 jobs in Energy Generation account for nearly 20 percent of green employment.

High **employment concentration** in a particular green segment indicates an area of strength and comparative advantage for a state. This means that the percentage of total employment in a particular segment is higher than the national average.[3] For example, California's Finance & Investment segment is nearly four and a half times more concentrated than the U.S. average, and the state is home to nearly half of all U.S. jobs in this segment. Similarly, Energy Generation is more than four times more concentrated than the U.S. average, and represents more than 45 percent of total U.S. jobs in Energy Generation.

Between 1995 and 2007, some segments have witnessed a **change in concentration** either by becoming more specialized over time or diminishing in concentration. This change is displayed by the placement along the horizontal axis (i.e. x-axis). California's concentration in Advanced Materials has more than



Size of bubble represents 2007 employment.
(Values are rounded.)

Data Source: Green Establishment Database
Analysis: Collaborative Economics

doubled since 1995, while employment concentration in Energy Infrastructure has increased by more than fifty percent.

Areas with high and increasing levels of concentration typically signal promising areas for targeting investment in R&D and commercialization, building university centers of excellence, as well as areas for focusing workforce development.

Taken together, these three dimensions represented in the bubble chart help to illustrate the characteristics of California's green economy. A more extensive green economy profile of California could compare growth in the green economy to that of the economy as a whole. Deeper analysis of California's leading segments such as Energy Generation would reveal detailed areas of specialization within the segment by the specific technologies or by the types of activities such as R&D or component manufacturing. Similarly, an analysis of emerging segments of comparative advantage such as Advanced Materials or Energy Infrastructure could identify specific technologies and sub-sectors for future growth. A deeper analysis could also result in a set of company snapshots that not only describe what the company does but also what its related industries are. For example, because the technologies are closely related, much of California's solar industry emerged from its semiconductor industry.

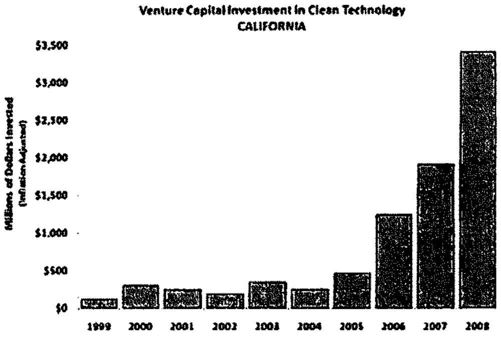
Green Technology Innovation

Since the global energy crisis in the 1970s, technology innovation in fields related to renewable energy sources and energy efficiency have taken place in waves. These waves reflect changes in public policy such as in research priorities set for federal funding (e.g. solar in the 1970s) as well as technological advance which spurred innovation in battery technology for small, remote devices like laptops and cell phones in the 1990s.

Regional variations exist in terms of where technological breakthroughs are taking place and where the adoption of new technology and practices is being spurred. Patent registrations and venture capital investment in technologies and processes that support alternatives to the carbon-based economy are two ways to track green technology innovation.

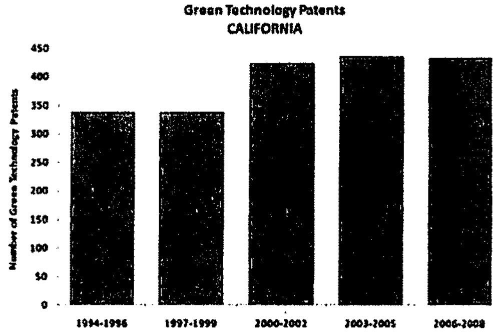
Cleantech investment reached an all time high in California with more than $3.4 billion in 2008. In 2008, investment in cleantech VC was more than 27 times higher than in 1999. From 2007 to 2008, total cleantech VC investment in the state grew by 78 percent.

United States cleantech investment reached an all-time high of $6 billion in 2008. Between 2007 and 2008 alone, total U.S. cleantech VC grew by 51 percent. In terms of the top segments attracting investment dollars, Energy Generation is the largest U.S. cleantech segment, accounting for 59 percent of total U.S. cleantech VC investment, followed by Energy Efficiency (8%), Energy Infrastructure (7%) and Energy Storage (7%). Energy Infrastructure is the fastest growing segment, increasing by $273 million from 2007 to 2008. Other top growing segments include Energy Generation, Manufacturing/Industrial, and Energy Generation.



Data Source: Cleantech Group™, LLC [illegible]
Analysis: Collaborative Economics

More than 430 green patents were registered in California between 2006 and 2008. The number of green technology patents increased by nearly 30 percent between the periods 1994-1996 and 2006-2008. For the U.S. as a whole, a total of 2,391 green technology patents were registered by American inventors between 2006 and 2008. Battery technology accounts for the largest share of patents (35%) registered in the U.S., followed by Fuel Cell technology (31%), and Hybrid Systems (11%). Growing by 61 percent over the recent periods, Wind Energy was the fastest growing area of green technology patent registrations (three-year periods 2003-05 to 2006-08).



Data Source: 1790 Analytics, Patents by Technology; USPTO Patent File
Analysis: Collaborative Economics

While not provided in this summary, a "deeper-dive" into a state's green economic profile could include the following:

- Cleantech Venture Capital Investment, by Segment
- Patent Registrations in Green Technology, by Technology Area
- Adoption of Green Technology (e.g. the percentage of energy generation from renewable sources, the percentage of vehicle registrations that are for alternative fuel vehicles)
- Energy Efficiency and Intensity (e.g. energy consumption, electricity consumption, greenhouse gas emissions relative to economic growth)

Fifteen Segments of the Green Economy

As published in Next 10's 2009 *California Green Innovation Index*:

GREEN SEGMENT	DESCRIPTION
1. **Energy Generation**	• Renewable energy generation (all forms of solar, wind, geothermal, biomass, hydro, marine & tidal, hydrogen, co-generation) • Associated equipment, controls, and other management software and services • Renewable energy consulting services • Research & Testing in renewable energy
2. **Energy Efficiency**	• Energy conservation consulting and engineering services • Building efficiency products and services • Alternative energy appliances (solar heating, lighting, etc.) • Energy efficiency research • Energy efficiency meters & measuring devices
3. **Transportation**	• Alternative fuels (biodiesel, hydrogen, non-corn-based ethanol) • Motor vehicles & equipment (electric, hybrid, and natural gas vehicles, diesel technology)
4. **Energy Storage**	• Advanced batteries (Li-Ion, NiMH) • Battery components & accessories • Fuel cells
5. **Air & Environment**	• Emissions monitoring & control • Environmental consulting (environmental engineering, sustainable business consulting) • Environmental remediation
6. **Recycling & Waste**	• Consulting services • Recycling (paper, metal, plastics, rubber, bottles, automotive, electronic waste and scrap) • Recycling machinery manufacturing • Waste treatment
7. **Water & Wastewater**	• Water conservation (control systems, meters & measuring devices) • Development and manufacturing of pump technology • Research and testing • Consulting services • Water treatment and purification products and services
8. **Agriculture**	• Sustainable land management and business consulting services • Sustainable supplies and materials • Sustainable aquaculture
9. **Research & Advocacy**	• Organizations and research institutes focused on advancing science and public education in the areas of: renewable energy and alternative fuels and transportation.
10. **Business Services**	• Environmental law legal services • Green business portals • Green staffing services • Green marketing and public relations
11. **Finance & Investment**	• Emission trading and offsets • Venture capital and private equity investment • Project financing (e.g. solar installations, biomass facilities, etc.)
12. **Advanced Materials**	• Bioplastics • New materials for improving energy efficiency
13. **Green Building**	• Design & construction • Building materials • Site management • Green real estate & development
14. **Manufacturing & Industrial**	• Advanced packaging • Process management • Industrial surface cleaning
15. **Energy Infrastructure**	• Consulting and management services • Cable & equipment

DATA NOTES

Green Business Activity

The nationwide analysis of green business activity was designed and conducted by Collaborative Economics, Inc. on behalf of the Pew Charitable Trusts. The methodology built off of earlier work carried out on behalf of Next 10, a California-based nonprofit, and published in the *California Green Innovation Index* (2008, 2009). The Pew Center on the States reformatted the results of the analysis and developed the report, *The Clean Energy Economy* (June 2009).

The accounting of green business establishments and jobs is based on multiple data sources (including New Energy Finance and the Cleantech Group^{TM}, LLC) for the identification and classification of green businesses and also leveraged a sophisticated internet search process. Collaborative Economics designed the parameters of the internet search platform which was engineered by QL2, a Seattle-based developer of business intelligence tools. The National Establishments Time-Series (NETS) database based on Dun & Bradstreet business-unit data was sourced to extract business information such as jobs. The operational definition of green is based primarily the definition of cleantech defined by the Cleantech Network. This sample offers a conservative estimate of the industry.

Green Technology Innovation

The Cleantech Group™, LLC provided venture capital investment data in Cleantech for all disclosed deals. The Cleantech Group™, LLC describes Cleantech as new technology and processes, spanning a range of industries that enhance efficiency, reduce or eliminate negative ecological impact, and improve the productive and responsible use of natural resources. Investment values were adjusted for inflation and are reported in 2008 dollars using the U.S. city average Consumer Price Index (CPI) of all urban consumers, published by the Bureau of Labor Statistics, U.S. Department of Labor.

Patent registrations in green technology are based on tailored search of U.S. Patent & Trade Office data performed by 1790 Analytics, a firm specializing in intellectual property evaluation services. Collaborative Economics defined the search parameters, and 1790 Analytics provided the search results for patents in the following fields of green technology: geothermal, hydro, solar & wind energy generation, energy storage, fuel cells, hybrid systems, batteries, and energy infrastructure.

END NOTES

---

[1] Nuclear energy generation is not included in their definition of the core green economy. However, CEI can carry out a state-level analysis of the nuclear energy industry.

[2] The jobs numbers reported in this analysis reflect all jobs at these business locations. In the case of multi-establishment companies, only the green establishments are included. While this approach does not examine specifically green occupations that are appearing across the entire economy (such as Chief Sustainability Officer), it does account for the businesses behind the products and services that these new professionals need to use in their jobs (such as advanced metering devices, co-generation equipment, and various high-efficiency materials).

The lack of standardized industry data with information on "green" products, services and occupations has resulted in the development of multiple methodological approaches to defining "green jobs" and the green economy. The definitions of green vary largely depending upon the underlying unit of measurement (i.e. data). Some approaches focus on the activities of occupations. Other approaches focus on businesses offering "green" products and services, while others focus on businesses that operate in a "green" manner regardless of the end products and services they sell. All of these approaches are valid and, from different vantage points, contribute to a better understanding of the emerging green economy.

[3] The employment concentration is represented in the placement of the bubble along the vertical (i.e. y-axis). A concentration of 1 indicates that the percentage of the state's green business employment in a given segment is equal to that for the U.S. as a whole.

UNIVERSITY OF CALIFORNIA, BERKELEY

Department of Agricultural and Resource Economics • 207 Giannini Hall • Berkeley, California 94720-3110

dwrh@Berkeley.edu
office: (510) 643-6362
fax: (510) 643-8911

Clean Energy and Climate Policies Lead to Economic Growth in the United States:

New analysis shows that adopting comprehensive clean energy and climate legislation could create up to 1.9 million jobs

Comprehensive clean energy and climate protection legislation, like the American Clean Energy and Security Act (ACES) that was passed by the House of Representatives in June, would strengthen the U.S. economy by establishing pollution limits and incentives that together will drive large-scale investments in clean energy and energy efficiency. These investments will result in stronger job growth, higher real household income, and increased economic output than the U.S. would experience without the bill.

New analysis by the University of California shows conclusively that climate policy will strengthen the U.S. economy as a whole. Full adoption of the ACES package of pollution reduction and energy efficiency measures would create between 918,000 and 1.9 million new jobs, increase annual household income by $487-$1,175 per year, and boost GDP by $39 billion-$111 billion. These economic gains are over and above the growth the U.S. would see in the absence of such a bill.

Table 1: U.S. Macroeconomic Impacts by 2020

	2010 Baseline	2020 Baseline Projection	2020 With ACES	Net Increase Due to ACES	Percent Change Due to ACES
Employment (Thousands)	189,404	213,062	213,980-214,959	918-1,897	0.4-0.9
GDP (2008$ Billions)	12,338	15,852	15,891-15,963	39-111	0.2-0.7

The new comprehensive economic assessment of ACES was conducted by a team of researchers at the University of California using EAGLE, a new state-of-the-art forecasting model, to study the detailed impacts of the legislation on the United States economy.[1] The model was developed collaboratively between the University of California at Berkeley, the University of Illinois (Urbana-Champaign) and Yale University.

EAGLE analysis of ACES findings:

- **Between 2010 and 2020, national employment would see a net increase of 918,000 (moderate-efficiency case) to 1.9 million (high-efficiency case) jobs under ACES—on top of a baseline increase of 24 million jobs over the same timeframe.**
- **By 2020, ACES would lead to average real personal income that is $487 to $1,175 higher per household per year than without the legislation (2008 dollars).**
- **ACES would result in U.S. real Gross Domestic Product that is $39 billion-$111 billion higher in 2020 than without legislation. That is a 0.2% to 0.7% increase on top of baseline growth of 28% between 2010 and 2020.** (See endnotes for definitions.)

By reducing our dependence on imported energy, the American Clean Energy and Security Act (ACES) will free us to commit more of our resources to domestic job creation while reducing our vulnerability to volatile oil prices, climate damage, and other threats to our national security. Moving from dirty to clean sources of energy will unleash a wave of more efficient technologies and drive innovation that will create new industries.

The cost reductions driven by ACES will boost our economy. The reason is simple: energy efficiency reduces costs for transportation and energy and thereby saves households and businesses money – money they can spend on domestic goods and services, which will create jobs for Americans. For example, over the last thirty years, California reduced its per capita electricity consumption to 40% below the national average. This saved households $56 billion, and those savings created 1.5 million additional jobs in California.

The EAGLE findings are consistent with previous analyses that have similarly demonstrated that clean energy investments create more jobs, across a wider variety of skill and education levels, than comparable investments in fossil-fuel energy sources. The Political Economy Research Institute (PERI) estimated in June 2009 that the combined effects of the American Reinvestment and Recovery Act ('Stimulus Bill') and ACES would yield a near-term net increase of 1.7 million jobs, based on a $150 billion shift in annual investment from traditional to clean energy. While the PERI analysis focuses on the near-term effect of such legislation, EAGLE was used to analyze the longer-term impact.

Results from both EAGLE and PERI are also consistent with modeling by U.S. government agencies – such as the Environmental Protection Agency, Congressional Budget Office, and the Department of Energy – that shows substantial economic

---

[1] The Environmental Assessment in GeneraL Equilibrium (EAGLE) model was developed at the University of California (Berkeley) in collaboration with researchers at the University of Illinois (Urbana-Champaign) and Yale University. The EAGLE model has been peer reviewed and full technical documentation is available on request.

STATEMENT OF ARTHUR A. ELKINS, JR., NOMINATED TO BE INSPECTOR GENERAL, U.S. ENVIRONMENTAL PROTECTION AGENCY

Mr. ELKINS. Thank you, Chairman Boxer. I really appreciate the opportunity to talk to you about my nomination this afternoon.

I would like to introduce my wife, Gail, who has been a real big supporter of mine throughout this whole process. I am really just thrilled with having her here and having her behind me. I would also like to acknowledge a couple of my colleagues from the Defense Office of Hearings and Appeals who have also come down to support me as well. So I would like to acknowledge them as well.

Mr. Fields.

Senator BOXER. Stand up, please, sir.

Mr. ELKINS. And Peregrine Russell-Hunter.

Senator BOXER. Welcome. Very good.

Mr. ELKINS. Madam Chairman and members of the committee, thank you for this opportunity to appear before you today as the President's nominee for Inspector General of the Environmental Protection Agency. I am deeply honored and grateful for the President's nomination. I am also mindful of the important role that the Environment and Public Works Committee plays in matters related to the EPA, including its Office of Inspector General.

The mission of the EPA OIG as defined by the Inspector General Act of 1978, stated briefly, is one, to conduct and supervise audits and investigations relating to EPA programs and operations; two, provide leadership, coordination and recommend policies for activities designed to promote economy, efficiency and effectiveness in the administration of EPA programs; three, prevent and detect fraud and abuse in EPA programs and operations; and four, provide a means for keeping the head of the EPA and the Congress fully and currently informed about problems and deficiencies relating to the administration of EPA programs and operations and the necessity for and progress of corrective actions.

The OIG is tasked with protecting the integrity of EPA programs as well as human health and the environment. As with other Federal agencies, the IG serves as the agency's chief audit and law enforcement executive with dual reporting responsibilities to the EPA Administrator and to the Congress. More specifically, the IG is tasked with providing the Administrator and EPA program managers with objective and independent findings and recommendations that are designed and intended to improve EPA program efficiency and effectiveness and to initiate investigations to identify and hold accountable those who defraud EPA's programs.

Moreover, the OIG through its hot line and other integrity awareness efforts also supports other important public policy initiatives, such as those articulated in the Ethics and Government Act, the Whistleblower Protection Act and other similar laws, rules and policies. Now, I am familiar with these tasks having served as the counsel to the Inspector General for the National Science Foundation for approximately 5 years. In that role I worked closely with the NSF Inspector General, OIG senior managers, attorneys, auditors, investigators and staff, support staff in audit and investigations planning, general management and OIG policy development. Moreover, for the past 16 years I have also served the public in the roles of public defender, prosecutor, department counsel, chief legal counsel and general counsel and associate general counsel for Federal and local agencies.

In the general counsel roles, I managed to staff of professional and support personnel in providing agency management with legal counsel and guidance on numerous Federal, State and administrative law legal issues. As a criminal prosecutor, public defender and department counsel my experience includes prosecuting, defending and investigating criminal, civil and administrative misconduct cases.

Now, my vision and expectations if confirmed as the EPA IG can be summarized under the following four management principles. One, exceed OIG customer expectations. I view the term customer in a broad sense. That is, OIG customers include Congress, EPA agency management and staff, other Federal agencies and State employees, the court, the general public and OIG staffers. In my view, integrity, accountability, credibility, reputation and effectiveness are all byproducts of the delivery of consistent excellent customer service. If confirmed, I intend to establish as an office-wide policy that exceeding customer expectations will be an OIG priority. This means that customer inquiries will be responded to in an expeditious and meaningful way. It also means that OIG work products will be consistently delivered in a timely manner, be relevant, accurate, objective, understandable, focused on the most significant issues facing the EPA, be of the highest quality and where applicable, include customer input.

The next principle is to maintain and expand OIG's subject matter expertise. The most important OIG asset is its employees. In short, the OIG is only as good as the expertise and commitment to excellence of its staff. If confirmed I will support staff development efforts and encourage staff to explore opportunities to grow personally and professionally.

No. 3, ensure OIG organizational and information integrity and safeguard OIG independence. Beyond the human resource, organization and information integrity are key factors in the success of any organization. Having an organizational structure that is flexible and responsive to the needs of its customers without sacrifice to timeliness or quality and with predictable and secure data access is crucial to the success and health of any organization. In short, having a flexible but predictable organization allows the organization to react more quickly to non-standard events, be more creative problem solvers, proactive and manage scarce resources more efficiently and effectively. If I am confirmed I will encourage the adoption or continuance of these management principles within the EPA OIG.

Further, IG independence and non-partisanship are critical to the OIG's success. In my view, a condition precedent to the acceptance of OIG's work products as credible and reliable is the extent to which its reputation for independence and non-partisanship are non-challenged. As such, if I am confirmed, I will be vigilant in safeguarding the most important in the OIG's toolbox: its independence.

Finally, operate the OIG in an ethical, professional and civil manner. The inclusion of this management principle affirms that should I be confirmed as the next EPA OIG I will continue the EPA OIG tradition of ensuring that the office operates to the highest standards of ethics, professionalism and civility. The role of the Inspector General in any Federal agency is important and challenging. With the challenge comes the opportunity to make a positive difference in the lives of many. If confirmed I will make a positive difference through my efforts to protect the taxpayers' investment from fraud, waste and abuse, while assisting the agency to exceed its goals. I will be personally committed to make the EPA OIG as successful in its mission as possible.

Thank you again for this opportunity to appear before you today. I look forward to answering any of your questions.

[The prepared statement of Mr. Elkins follows:]

STATEMENT OF ARTHUR A. ELKINS, JR.
NOMINEE FOR INSPECTOR GENERAL
ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
FEBRUARY 9, 2010

Madam Chairman and members of the Committee, thank you for this opportunity to appear before you today as the President's nominee for Inspector General (IG) of the Environmental Protection Agency (EPA). I am deeply honored and grateful for the President's nomination. I am also mindful of the important role that the Environment and Public Works Committee plays in matters related to the EPA, including its Office of Inspector General (OIG).

The mission of the EPA OIG, as defined by the Inspector General Act of 1978, as amended (IG Act), stated briefly, is to (1) conduct and supervise audits and investigations relating to EPA programs and operations; (2) provide leadership, coordination and recommend policies for activities designed to promote economy, efficiency and effectiveness in the administration of EPA programs; (3) prevent and detect fraud and abuse in EPA programs and operations; and (4) provide a means for keeping the head of the EPA and the Congress fully and currently informed about problems and deficiencies relating to the administration of EPA programs and operations and the necessity for and progress of corrective action.

The OIG is tasked with protecting the integrity of EPA programs, as well as human health and the environment. As with other federal agencies, the IG serves as the agency's chief audit and law enforcement executive, with dual reporting responsibilities to the EPA Administrator and to the Congress. More specifically, the IG is tasked with providing the Administrator and EPA program managers with objective and independent findings and recommendations that are designed and intended to improve EPA program efficiency and effectiveness, and to initiate investigations to identify and hold accountable those who defraud EPA's programs. Moreover, the OIG, through its Hotline and other integrity awareness efforts, also supports other important public policy initiatives such as those articulated in the Ethics in Government Act, the Whistleblower Protection Act and other similar laws, rules, and policies.

I am familiar with these tasks, having served as the Counsel to the Inspector General for the National Science Foundation (NSF) for approximately five years. In that role, I worked closely with the NSF Inspector General, OIG senior managers, attorneys, auditors, investigators, and support staff in audit and investigations planning, general management, and OIG policy development. Moreover, over the past sixteen years, I have also served the public in the roles of Public Defender, Prosecutor, Department Counsel, Chief Legal Officer and General Counsel, and Associate General Counsel for federal and local agencies. In the General Counsel roles, I managed a staff of professional and support personnel in providing Agency management with legal counsel and guidance on numerous federal, state and administrative law legal issues. As a criminal prosecutor, public defender, and Department Counsel, my experience includes prosecuting, defending, and investigating criminal, civil, and administrative misconduct cases.

My vision and expectations, if confirmed as the EPA IG, can be summarized under the following four management principles:

(1) Exceed OIG customer expectations - I view the term "customer" in a broad sense. That is, OIG customers include Congress, EPA agency management and staff, other federal agencies and state employees, the court, the general public and OIG staffers. In my view, integrity, accountability, credibility, reputation, and effectiveness are all by-products of the delivery of consistent excellent customer service. If confirmed, I intend to establish, as an office-wide policy, that exceeding customer expectations will be an OIG priority. This means that customer inquiries will be responded to in an expeditious and meaningful way. It also means that OIG work products will be consistently delivered in a timely manner, be relevant, accurate, objective, understandable, focused on the most significant issues facing the EPA, be of the highest quality, and where applicable, include customer input;

(2) Maintain and expand OIG subject matter expertise - The most important OIG asset is its employees. In short, the OIG is only as good as the expertise and commitment to excellence of its staff. If confirmed, I will support staff development efforts and encourage staff to explore opportunities to grow personally and professionally;

(3) Ensure OIG organizational and information integrity and safeguard OIG independence - Beyond the human resource, organizational and information integrity are key factors in the success of any organization. Having an organizational structure that is flexible and responsive to the needs of its customers, without sacrifice to timeliness quality, and with

predictable and secure data access, is crucial to the success and health of any organization. In short, having a flexible but predictable organization allows the organization to react more quickly to non-standard events, be more creative problem solvers, proactive and manage scarce resources more efficiently and effectively. If confirmed, I will encourage the adoption or continuance of these management principles within the EPA OIG. Further, IG independence and nonpartisanship are critical to the OIG's success. In my view, a condition precedent to the acceptance of OIG's work products as credible and reliable is the extent to which its reputation for independence and nonpartisanship are unchallenged. As such, if confirmed, I will be vigilant in safeguarding the most important asset in the OIG's tool box, its independence; and,

(4) Operate the OIG in an ethical, professional and civil manner - The inclusion of this management principle affirms that should I be confirmed as the next EPA IG, I will continue the EPA OIG tradition of ensuring that the office operates to the highest standards of ethics, professionalism, and civility.

The role of the Inspector General in any federal agency is important and challenging. With the challenge comes the opportunity to make a positive difference in the lives of many. If confirmed, I will make a positive difference through my efforts to protect the taxpayers' investment from fraud, waste, and abuse, while assisting the Agency to exceed its goals. I will be personally committed to make the EPA OIG as successful in its mission as possible.

Thank you again for this opportunity to appear before you today. I look forward to answering your questions.

Environment and Public Works Committee Hearing
February 9, 2010
Follow-Up Questions for Written Submission
for
Arthur A. Elkins Jr.

Questions from:
Senator Barbara Boxer

1. The EPA's Office of Inspector General has in the past conducted broad reviews of EPA's programs.

For example, in 2004, the EPA IG did a broad programmatic review of the Superfund program which found that "limited funding prevented EPA from beginning construction at all sites...and caused projects to be segmented into phases and/or scaled back to accommodate available funding."

Do you anticipate conducting these types of broad reviews of EPA's programs if you are confirmed as EPA's Inspector General?

The Inspector General Act of 1978, as amended (IG Act), directs Inspectors General "to recommend policies for, and to conduct, supervise, or coordinate other activities carried out or financed by such establishment for the purpose of promoting economy and efficiency in the administration of, or preventing and detecting fraud and abuse in, its programs and operations." In my view, conducting broad reviews of EPA's programs is consistent with the duties and responsibilities of Inspectors General under the IG Act. As such, if confirmed, I anticipate that broad reviews of EPA programs will be conducted where warranted.

2. The EPA's Inspector General has reported to Congress that over the last three years the IG has had the fewest number of staff since 2000 -- and that the IG needs to hire more people to accomplish its mission.

If confirmed, will you consider examining the reasons for the Office of Inspector General's loss of personnel, and how the IG's Office can better retain and invest in personnel?

Yes, if confirmed, I will examine the reasons for the Office of Inspector General's (OIG) loss of personnel, and how the OIG can better retain and invest in its personnel.

3. The EPA's Inspector General serves as the conscience of the Agency. The IG keeps the EPA true to its mission of protecting public health and the environment.

If confirmed, can you please describe how you can best accomplish this goal?

In my view, the primary source of an Inspector General's (IG) credibility flows directly from the IG's reputation for providing independent, objective and non-partisan recommendations, based on legally sound and professionally developed audit and investigative work-products. Demonstrating the IG's independence allows the OIG to serve as the conscience of the Agency, and, as such, keeps the Agency true to its mission of

protecting public health and the environment. If confirmed, I will be committed to protecting the OIG's independence, which, in my view, will assist the Agency achieve its mission.

4. You have worked as counsel the Inspector General of the National Science Foundation and you currently work in the General Law Office of the EPA.

Can you please tell me what skills you have learned in these positions that will best prepare you to be EPA Inspector General, if you are confirmed?

As Counsel to the Inspector General of the National Science Foundation (NSF) I worked closely with the NSF Inspector General, OIG senior managers, attorneys, auditors, investigators, and support staff in audit and investigations planning, general management, and OIG policy development. As the Associate General Counsel for EPA's Office of General Counsel's General Law Office, I manage a staff of professional and support personnel in providing EPA's management with legal counsel and guidance on numerous federal, state and administrative law legal issues related to Information Law, Employment Law and Intellectual Property Law. In both positions, I have learned that in managing people, things and conflicts, it is important to be a good listener; engage in continual learning activities; make decisions; and lead. If confirmed, I believe that these skills will serve me equally as well in the role of EPA Inspector General.

5. Impartiality, integrity and independence are the cornerstone of a strong Inspector General.

Can you please describe the importance that you place on these qualities in an IG and how you believe an IG should instill the same qualities in his staff?

I believe that the maintenance of IG independence is critical to the OIG's effectiveness and its reputation among its customers for impartiality and integrity. In my view, when an OIG's reputation for independence is questioned, it has the effect of undermining the efforts and work-product of OIG staff, and ultimately undermines the credibility of the Agency as well. This outcome is not in the interests of the American people. Articulating clearly the importance of the role that IG independence plays to the success of both the OIG mission and Agency mission is, in my view, the responsibility of the IG. I believe that this is a leadership issue. If confirmed, I will exercise leadership by articulating the importance of IG independence to both EPA management and OIG staff, and by demonstrating it in my decisions and actions. I believe that my leadership on this issue will serve to instill the same qualities in OIG staff.

Environment and Public Works Committee Hearing
February 9, 2010
Follow-Up Questions for Written Submission
for
Arthur A. Elkins Jr.

Senator James M. Inhofe

1. In your soon-to-be role as Inspector General of the EPA, would you agree that, if there were allegations of employees within your Agency involved in suppressing information or manipulating public data in order to reach a preconceived conclusion, that this matter should be fully investigated?

The IG Act provides that "the Inspector General may receive and investigate complaints or information ... concerning the possible existence of an activity constituting a violation of law, rules, or regulations, or mismanagement, gross waste of funds, abuse of authority or a substantial and specific danger to the public health and safety." As such, consistent with the IG Act, I agree that allegations constituting an abuse of authority, as described in your question, is within the IG's jurisdiction to investigate, and, as such, should be investigated.

Would you also agree that if there were allegations of employees who violated federal laws or policies, such as the Freedom of Information Act, OMB administrative procedures, or other rules or Agency guidelines, such as those governing peer-review, that these matters should also be fully investigated?

Yes.

2. Mr. Elkins, the OIG is expected to carry out his duties with objectivity and without political bias. This is paramount. What assurances can you provide that you will put politics aside and focus on substance rather than political party affiliation?

The IG Act provides that the appointment of an IG should be "without regard to political affiliation." I interpret this provision to mean that the work of the IG must also be performed in an objective and non-partisan manner. This legal requirement is not unlike my experience, obligations, duties and responsibilities serving as a prosecutor, where my role was to enforce the law without partisan considerations or influence, among other things. If confirmed, I will follow the law as articulated in the IG Act and serve the public as the EPA IG in a non-partisan manner.

Environment and Public Works Committee Hearing
February 9, 2010
Follow-Up Questions for Written Submission
for
Arthur A. Elkins Jr.

Senator David Vitter

1. Since coming onboard EPA what have you done to ensure your independence from issues and staff that could create a conflict of interest and/or limit your ability to investigate EPA and staff?

As the Associate General Counsel for the Office of General Counsel's General Law Office, my management responsibilities include providing legal counsel on information law, employment law, and intellectual property law. Legal issues in these areas are related to internal Agency support functions (e.g., personnel, FOIA, patent infringement enforcement, etc.). As such, my involvement in Agency legal matters that may constitute a conflict of interest in regards to activities involving major Agency media areas (e.g., air, water, toxics, and waste), has not surfaced. Moreover, since my nomination, I have instructed OGC staff to exclude me from any matters that may implicitly or explicitly create the appearance of a conflict of interest. As such, no conflicts exist that I am aware of that would limit my ability, if confirmed, to investigate EPA and its staff.

2. Under your interpretation of the Regulatory Flexibility Act what is EPA required to do before moving forward with new regulations that could impact small businesses?

Under the Regulatory Flexibility Act, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration.

3. Under your interpretation of the Data Quality Act what is EPA's responsibility in ensuring that its regulations are based on unbiased science?

It is my understanding that the Data Quality Act requires federal agencies to issue information quality guidelines that ensure the quality, utility, objectivity and integrity of the information that they disseminate and further provide mechanisms for affected persons to correct such information. I believe that under the provisions of the Data Quality Act, Agencies must ensure that information they disseminate meets certain quality standards.

Environment and Public Works Committee Hearing
February 9, 2010
Follow-Up Questions for Written Submission
for
Arthur A. Elkins Jr.

Senator John Barrasso

1. If confirmed as Inspector General, will you commit to us that you will pursue any misconduct, waste, fraud, theft, or other criminal activity by individuals or groups related to EPA's operation, no matter where those investigations may lead?

Yes.

2. Having worked at the EPA as an associate general counsel at EPA, do you believe that you can be an unbiased watchdog for this agency?

Yes.

3. Do you believe it is the responsibility of the EPA Inspector General to investigate and report instances where scientific procedures at EPA are circumvented?

Yes.

If confirmed, will you pursue those instances?

Yes.

4. Do you believe it is the responsibility of the EPA Inspector General to investigate instances where whistleblowers are silenced by their superiors at the agency?

Yes, in association with the Office of Special Counsel, which has lead jurisdiction in cases involving whistleblowers.

If confirmed, will you pursue those instances?

Yes, in association with the Office of Special Counsel, which has lead jurisdiction in cases involving whistleblowers.

5. Do you believe it is the responsibility of the EPA Inspector General to investigate instances where agency employees are smeared publicly in the press by higher ups in the agency or in the Administration, simply for providing their best advice and counsel?

Yes.

6. Do you believe it is appropriate to work collaboratively with this committee, which also provides oversight over EPA?

Yes.

7. Will you give equal attention to requests for investigations from the Minority as well as the Majority?

Yes.

Senator BOXER. Thank you so much, Mr. Elkins.

Mr. Gohl, Federal Cochair, Appalachian Regional Commission. We look forward to hearing from you. If you have any guests in the audience, please let us know.

STATEMENT OF EARL GOHL, JR., NOMINATED TO BE FEDERAL COCHAIR, APPALACHIAN REGIONAL COMMISSION

Mr. GOHL. Thank you, Chairman Boxer and members of the committee, for giving me this opportunity to come here today to talk to you about my nomination as the Federal Cochair of the Appalachian Regional Commission. Today, my youngest daughter, Erin, is here with me.

I am very honored that President Obama has nominated me for this position. The Appalachian Regional Commission is a Federal-State partnership that seeks to foster economic development, create jobs and improve the quality of life in the 13-State region that runs along the Appalachian Mountains, from the southern tier of New York to northeastern Mississippi. The ARC was created to help close the socioeconomic gap between Appalachia and the rest of the Nation.

My professional career has focused on working with State and local government to create opportunities for economic growth and development. I have 20 years of experience as an elected or appointed official in Pennsylvania, which is one of the key ARC States.

As the Deputy Secretary of the Pennsylvania Department of Community Affairs my responsibilities included the operation of five bureaus and five regional offices that worked daily with local governments. In that capacity I was directly confronted by the economic challenges facing the Appalachian region. I saw first-hand the impact ARC's programs could have on my State's rural communities. My responsibilities included awarding and managing over $100 million annually in Federal and State funds that focused on the housing and community development needs of Pennsylvania communities. In State government my focus was on ways to expand the arsenals of tools available for small towns to help them build the capacity to respond to their challenges.

My 7 years as a local elected official gave me first-hand experience in dealing with the challenges of local governments, whose needs far out-strip available resources, and taught me how economic policy made far from the halls of the city or from town hall can have a very dramatic and very positive impact on communities. It gave me great respect for local officials who work each day and often long into the night to strengthen their communities' futures.

The experience of being in the Department of Congressional Liaison ingrained in me the importance of both adhering to Administration policies and principles and also having responsive, transparent and timely communications with Congress if the agency is going to succeed in fulfilling its mission. If I am confirmed, I will be fully responsive to the requests of this committee.

Appalachia has made considerable progress since ARC was created, with reductions in the poverty and infant mortality rates and increases in per capita income. But many significant challenges remain, particularly within the context of the current economic downturn, in which three-fourths of Appalachia's 420 counties have unemployment rates higher than national rates. Your committee recognized the importance of ARC's work in 2008 when it provided a 5-year reauthorization of the Commission's programs.

If I am confirmed I will be committed to carrying out the objectives of the 2008 Reauthorization. In 2010 the Commission will be developing a new strategic plan. This document will be the Commission's compass and will reflect the 2008 authorization and the priorities of the Appalachian Governors. While I don't want to prejudge the policy, the policy choices that the Commission may make as part of the process, I think the Commission's recent work in three particular areas merits strong consideration as priorities for the ARC in the future. The first is in continuing to complete the Appalachian Development Highway system. The second is to strengthen the competitiveness of Appalachian communities through better access to and use of broadband technology. And third helping Appalachian States and local governments diversify their economies through new jobs and renewable energy and energy efficiency.

Much of the success of the ARC stems from the fact that it is a bottom-up approach to economic development. ARC projects originate at the local level. The ARC system is designed to ensure that the agency grants reflect local and State priorities. The region's local development agencies and districts are critical to this process. If I am confirmed I will respect this local, State, Federal approach to community and economic development.

I am honored by the confidence President Obama has placed in me to lead the Appalachian Regional Commission. The ARC was conceived and pursued by a group of Appalachian Governors, advocated by Presidents Johnson and Kennedy and enacted and reauthorized by Congress on a bipartisan basis. It has an ambitious agenda with some very modest resources.

At the end of the day, if I am confirmed my objective will be that each Federal dollar expended will be an investment in the economic futures of Appalachian families, that will generate a return for American taxpayers. I look forward to the opportunity of working with this committee in a common mission, providing greater economic opportunities for the 23 million Americans who call Appalachia home.

I would be glad to answer your questions.

[The prepared statement of Mr. Gohl follows:]

Statement of Earl F. Gohl, Jr.
Nominee To Be
Federal Co-Chair of the Appalachian Regional Commission
Before the Senate Committee on Environment and Public Works
February 9, 2010

Chairman Boxer, Ranking Member Inhofe, and Members of the Committee:

Thank you for giving me the opportunity to come before you and discuss my nomination to be Federal Co-Chair of the Appalachian Regional Commission (ARC). I am very honored that President Obama has nominated me for this important position.

The Appalachian Regional Commission is a federal-state partnership that seeks to foster economic development, create jobs, and improve the quality of life in a 13-state region that stretches along the Appalachian mountains from the Southern Tier of New York to northeastern Mississippi. ARC was created to help close the profound socioeconomic gaps between Appalachia and the rest of the nation. Central to its work is a collaborative approach that links federal agencies, the Appalachian Governors, the region's 73 local development districts, non-profit groups and the private sector in a common mission of making the region's rural communities more competitive.

My entire professional career has focused on working with state and local governments and helping them create opportunities for economic growth and development—precisely the purpose of the Appalachian Regional Commission.

I have 20 years of experience as an elected or appointed official in Pennsylvania, the state with the greatest amount of ARC territory of any of the thirteen Appalachian states. As the Deputy Secretary of the Pennsylvania Department of Community Affairs, my responsibilities included the operation of five bureaus and five regional offices that worked daily with local governments. In that capacity I was directly confronted by the economic challenges facing the Appalachian region—52 of Pennsylvania's 67 counties are in the ARC territory—and I saw first-hand the impact ARC's programs could have in my state's rural communities.

My responsibilities included awarding and managing $100 million annually in federal and state funds that focused on the housing and community development needs of Pennsylvania communities, including those within the ARC region. Many of these local grants were coordinated by Pennsylvania's local development districts, a key component of the ARC structure. Overseeing these grants gave me a good sense of what works in rural community development. In state government my focus was on ways to expand the arsenal of tools available for small towns and to help them build the capacity to respond to their challenges.

My seven years as a local elected official gave me firsthand experience in dealing with the challenges of local governments whose needs outstrip available resources, and taught me how economic policy made far from the center of town can have a dramatic local impact. It gave me great respect for local leaders who work each day to strengthen their community's future.

My work in Washington for three Governors and two Labor Secretaries has given me a strong dose of reality as to how challenging it is to accomplish some things which look so simple from the steps of City Hall or a Capitol. It has given me the experience of being a strong advocate for addressing the needs of state and local governments.

Additionally, the experience of being a departmental Congressional liaison ingrained in me the importance of both adhering to Administration policy and principles and having responsive, transparent, timely and open communications with the Congress if the agency is going to successfully fulfill its mission. If I am confirmed, I will be fully responsive to requests from this Committee.

Appalachia has made considerable progress since ARC was first created; the poverty rate has been cut in half, the infant mortality rate has been reduced by two-thirds, and the per capita income gap between Appalachian and the nation has narrowed.

But many significant challenges remain before the region is fully at parity with the rest of the nation. Twenty percent of Appalachian households still do not have access to community water systems, compared with 10 percent nationwide. And 47 percent of Appalachian households are not served by public sewer systems, compared with a national average of 24 percent. The percentage of Appalachians with a college degree is less than three-fourths of the national average, and the gap has widened.

The current economic downturn has affected Appalachia even more severely than other parts of the nation. Overall, the rate of job loss has been more severe in the Appalachian region than in the nation as a whole, due in part to the region's disproportionate reliance on manufacturing and extractive industries. Almost three-fourths of Appalachia's 420 counties have unemployment rates higher than the national average.

Your Committee recognized the importance of ARC's work in 2008 when it provided a five-year reauthorization of the Commission's basic programs. This legislation recognized the vibrancy of the ARC model, and provided additional tools for the Commission to deploy in helping communities diversify their economies and make them more competitive. It also continued the agency's emphasis on targeting resources to the areas of greatest need. If I am confirmed, I will be committed to carrying out the objectives of the 2008 reauthorization.

In 2010 the Commission is scheduled to develop a new five year strategic plan with a set of priorities established in collaboration with the Appalachian Governors. This document will be the Commission's compass and will reflect both the key elements of the 2008 authorization and the priorities of the Appalachian Governors. While I do not want to prejudge the policy choices that the Commission may make as part of that strategic planning process, I think the Commission's recent work in three particular areas is making an important difference in the region and these merit strong consideration as program priorities for the Commission in the future:

1. **Appalachian Development Highway System (ADHS).** The Appalachian Development Highway System was a critical component of the original authorization of ARC. Congress, the Administration, and the Governors acknowledged that lack of access to highways was a significant impediment to economic growth. Work to fulfill this longstanding commitment to Appalachian families needs to continue until it is completed.

2. **Broadband Technology.** Technology continues to reshape the world; and where new technology has become an integral part of life, communities have experienced economic growth. Appalachian Governors have been aggressive in this area, and partnering with the Commission can strengthen their efforts as well as coordinate interstate broadband integration to more quickly and efficiently bring broadband access to Appalachian communities.

3. **Energy.** Last fall the ARC conference on *New Energy. New Jobs. New Opportunities for Appalachia* shared ideas and best practices on how communities can use their energy resources and emerging energy technologies and practices to diversify and strengthen their economies. The Commission can assist the states in their efforts to develop diversified energy jobs that have the potential for critical economic growth.

One of the roles of the Commission is to be a liaison with other federal agencies and to help better coordinate the delivery of federal programs within Appalachia. The Federal Co-Chair must take the lead in this effort. Last summer the Administration launched a special interagency effort focused on Appalachia under the auspices of the White House Council on Environmental Quality. The initiative was initially targeted primarily to boosting the creation of green jobs in the region, but as the conversations with ARC and the other agencies continued, the initiative expanded to be a larger effort to diversify and strengthen the Appalachian economy. It reflects the President's commitment to making Appalachia a full partner in the national economic recovery.

I understand that roughly a dozen federal agencies are currently working together, in close collaboration with ARC, to identify ways that their programs can better meet the region's needs. If I am confirmed, I will work to support this effort and be a strong voice for the needs of Appalachia within the federal establishment.

Just as the success of ARC requires strong relationships with its sister federal agencies and its state partners, so success also demands that the agency be actively engaged with a diverse group of stakeholders in the region. It is also important to have open lines of communication with Congress, particularly with those Members who represent the region.

Finally, I believe much of the success of ARC stems from the fact that it takes a "bottom-up" approach to economic development. ARC projects originate at the local level; they are not generated in Washington, D.C. Rather, the ARC system is designed to ensure that the agency's grants reflect local priorities. The region's local development districts are critical to this process. They provide the "on the ground" reality about local needs, conditions, and goals. If I am confirmed, I will seek the advice of the local development districts in shaping Commission policies.

I am honored by the trust President Obama has placed in me to lead the Appalachian Regional Commission at this critical time. The ARC was conceived and pursued by a group of Appalachian Governors, advocated by Presidents Kennedy and Johnson, and enacted and reauthorized by Congress on a bipartisan basis. It has an ambitious agenda with modest resources. At the end of the day, it will be my objective, if I am confirmed, that each federal dollar expended will be an investment in the economic futures of Appalachian families that will generate a return for American taxpayers.

I look forward to the opportunity of working with this Committee in a common mission of providing greater economic opportunity for the 23 million Americans who call Appalachia home. I am happy to respond to any questions.

Environment and Public Works Committee Hearing
February 9, 2010
Follow-Up Questions for Written Submission to
Mr. Earl Gohl

Senator Barbara Boxer

1. The recent economic downturn has been particularly difficult for those areas of the country that were already economically distressed. What do you see as the biggest challenge for the Appalachian Regional Commission in the coming years?

The 1964 report of the President's Appalachian Regional Commission stated, "The average Appalachian...has not matched his counterpart in the rest of the United States as a participant in the Nation's economic growth." This was the critical issue which brought 13 Governors and the President together to establish the ARC. Since that report was issued, in Appalachia, poverty has dropped, infant mortality has declined, high school and college completion rates have increased and 85% of the Appalachian Development Highway System (ADHS) has been completed. However there are still dramatic economic gaps between Appalachia and the rest of the nation as demonstrated by the fact that almost three-fourths of Appalachia's 420 counties have unemployment rates higher than the national average.

From my point of view, the greatest challenges will continue to be the need to increase job opportunities and per capita income in Appalachia to reach parity with the nation so that " average Appalachian" matches their counterpart "in the rest of the United States as a participant in the Nation's economic growth."

2. Recent research by the Southeast Energy Efficiency Alliance found that "establishing bold energy-efficiency initiatives in Appalachia could significantly cut energy consumption, resulting not only in substantial cost savings (an estimated $21.4 billion per year by 2030), but also in the creation of more than 75,000 jobs over the next 20 years." How important do you think energy efficiency is for communities in Appalachia?

Energy efficiencies can have significant beneficial impacts on working families and small businesses in Appalachia and have the potential to make significant contributions to the Appalachia economy. In March 2009, ARC released a report entitled, "Energy Efficiency in Appalachia: How Much More is Available, at What Cost, and by When?" which outlines the significant energy efficiency savings that are available in the Appalachia Region.

The report indicated that when compared with the rest of the nation, Appalachia spends slightly more of its energy on residential and commercial uses than the nation on average; however, it goes on to say that, "When indexed to personal

income, the Region is considerably more energy intensive than the national average." This suggests that there is substantial opportunity in Appalachia for energy efficiency improvements and the jobs that are associated with those improvements.

Environment and Public Works Committee Hearing
February 9, 2010
Follow-Up Questions for Written Submission to
Mr. Earl Gohl

Senator Benjamin L. Cardin

The North/South Appalachian Highway:
1. This road project is a critical component of the 1965 Congressional authorization of the Appalachian Development Highway System (ADHS) and a top priority for Western Maryland residents and local businesses. The ADHS is 86.5% complete. The North/South Appalachian Corridor Feasibility Study of2001 identified the alignment of the US 219 and US 220, which runs through Garrett County, Maryland as having the most significant impact on economic development and job creation within the corridor. Improvements to these two roads are estimated to create upwards to 12,000 new permanent jobs and 20,000 construction jobs in the three affected states.

Will ARC, in working with the USDOT and the other states of jurisdiction, make completion of this North/South Appalachian Highway a priority?

In my statement submitted to the Committee I indicated that working toward the completion of the ADHS would be a priority, as it was one of the original promises made to working families in Appalachia when the ARC was established. Each ARC state determines the priority for funding work on ADHS corridors within that state. While much of the priority setting is within the purview of the states, if confirmed I would certainly be interested in working with them on approaches that can support their efforts to complete this critical link.

2. A major barrier to the completion of this project is the federal prohibition on the state's to use toll credits as matching funds. This provision was written into the Transportation Bill authorization and I have heard from numerous stakeholders in Western Maryland that even while Maryland would not necessarily use toll credits for our portion of the road it has been a major hindrance for other states that we are with to complete North/South Appalachian Highway. I am committed to helping complete this project and will work to remove this prohibition.

Will you, in your capacity as ARC chairman, support the repeal of the toll-credit prohibition?

I appreciate your concerns relative to the toll-credit prohibition. Should I be confirmed, I will request an analysis of the issue. I do not have a predilection either in support or opposed to the credit, but given that Congress continued the prohibition in SAFETU-LU, I think it is important to understand the underpinnings

of that decision, and how it will impact the completion of ADHS. If confirmed, I look forward to working with you further on this issue.

Working with Western Maryland's Economic Development District:

3. The Tri-County Council of Western Maryland is responsible for bringing many great economic incubator projects to Washington, Garrett and Allegheny Counties. They have an excellent working partnership with the ARC. They appreciate all the support they have gotten from the ARC over the years.

Are you committed to maintaining ARC's tradition of working closely with the local partners?

The ARC tradition of working closely with local partners is critical to the agency's effectiveness. Much of the success of ARC stems from the fact that it takes a "bottom-up" approach to economic development. ARC projects originate at the local level; they are not generated in Washington, D.C. Rather, the ARC system is designed to ensure that the agency's grants reflect local priorities. The region's local development districts are critical to this process. They provide the "on the ground" reality about local needs, conditions, and goals. If I am confirmed, I will seek the advice of the local development districts in shaping Commission policies.

The Tri-County Council of Western Maryland would like for you to meet with them and visit some the ARC projects they have had a hand in implementing. Would you take a trip out to Frostburg once you are confirmed?

Yes, if confirmed I would expect to travel to Western Maryland. It is my anticipation to have an active travel schedule throughout the Appalachian region and to be actively engaged with both the state and local representatives.

The ARC's Structure:

4. There are 75 ARC districts and Western Maryland is a district of its own that is then subdivided into the three counties (Garrett, Allegheny and Washington). This structure works very well for Maryland's Appalachia counties. I would like would like to see the structure of the district remain exactly as they are.

- Do you have any plans to alter the ARC districts' structure?

I have no plans to alter the ARC districts' structure if confirmed; however, it is my understanding that each state determines the structure of the local development districts in Appalachia.

The Consolidated Technical Assistance Program:

5. This program was eliminated under the former federal co-chair's leadership (Anne Pope). This program allowed the state to give small technical assistance grants. This program was very helpful to many of Western Maryland's small municipalities.

- Would you work to restore this program?

While I am not familiar with the specifics of decisions made with regard to the Maryland consolidated technical assistance program, or any grant decisions previously made by the ARC, if confirmed I will learn more about this program. I also look forward to discussing this and other programs that are important to economic development in Maryland.

Environment and Public Works Committee Hearing
February 9, 2010
Follow-Up Questions for Written Submission to
Mr. Earl Gohl

Senator James M. Inhofe

1. Mr. Gohl, your statement shows that you recognize the overall goals and mechanisms of the Commission, as well as some of the challenges faced by the region. I understand, though, that you do not have previous experience working directly with the ARC. Could you please discuss how you plan to familiarize yourself with the details of the organization, its programs and the various challenges faced by all 13 Appalachian states?

As part of the confirmation process, I have had a series of meetings and discussions with Committee members and their staffs, which I have found extremely helpful in understanding the economic development needs of the states.

I have consulted with the two previous Federal Co-Chairs of the ARC, Jesse White and Anne Pope, and sought their input on the role of the Federal Co-Chair, as well as critical issues in the operation of the organization, their relationship with the states and local development districts, and the challenges and issues which the states confront.

If confirmed, it is my intention to continue to reach out to both of them during the transition and during my tenure at the Commission.

I have also conducted an extensive review and reading of the ARC authorizations and strategic plans which provide for a blueprint for operations, its budget documents and Inspector General reports that provide for the financial picture of the agency, and the 13 state development plans which give critical insight to challenges and priorities of the states and local development districts. I have read or reviewed the extensive collection of studies and reports which the ARC has issued over the years on energy, healthcare, infrastructure, ADHS, the definition of distress, education, and telecommunications, as well as entrepreneurship, leadership development and most important the reports which provide evaluations of various programs and policies.

In addition I have carefully read the 1964 Report to President Johnson, "A Report by the President's Appalachian Regional Commission 1964" that is the foundation for the establishment of the ARC. I have also read Uneven Ground, Appalachia since 1945 by Ronald Eller, Appalachia, a History by John Phillip

Williams, Reformers to Radicals, the Appalachian Volunteers and the War on Poverty by Thomas Kiffmey.

However, if confirmed, it will be critical to engage the agency's partners and stakeholders: the states, the local development districts and other stakeholders, as well as the ARC staff.

ARC is scheduled to develop a new strategic plan in 2010, and it is my intention to use that structure and that process to become thoroughly engaged, "with the details of the organization, its programs and the various challenges faced by all 13 Appalachian states."

The strategic planning process provides an important opportunity for me to engage the three critical stakeholders: the states, the local development districts, and the ARC staff. It is a process which invites participation, comments and critiques from outside of Washington, and lays open for discussion the operations as well as the goal and objectives of the agency. It is a process that not only provides the details of the organization and the challenges of the states; but it provides important insights as to how policies and programs affect local communities.

In addition, if confirmed I intend to reach out to the local stakeholders and would plan to have substantive conversations with each of the state representatives as soon as possible. If confirmed I would also set an itinerary to visit each of the ARC states at least once within the first several months. My sense is that the Federal Co-Chair is not a job that can be done by sitting in Washington.

Finally, I would note that transitions do involve the accumulating and digesting information and data, but the more critical element is establish working relationships and levels of confidence. If confirmed, my first goal is to begin to lay that foundation with the states and to be clear in regarding my interest in working with them in a way which supports their efforts to create jobs and economic opportunity in their jurisdictions.

2. Please describe the work you have done while self-employed as a consultant from February 2009 to September 2009.

During this period I consulted for two companies, Citizens for the Future and Civic Census Group, that were engaged on a project to assist Atlantic City casino workers to secure a labor agreement after they had voted in 2007 to join a union. My work related to that project was limited to conducting a review of the business conditions of the gaming industry on the East Coast.

3. Newspaper and blog reports raised questions regarding the activities of Citizens for the Future, Inc. in a 2009 mayoral race in Hoboken, New Jersey. This organization made Expenditures to Civic Census Group within the time frame you listed as acting as a Consultant. Were you involved in this work in any way? If so, please detail your role, as Well as any additional pertinent information on this work.

In 2009 I was not involved in any election work, paid or volunteer, in New Jersey or any other state with Civic Census or any other private or public entity; and I am completely unfamiliar with the 2009 Hoboken election.

4. There is concern about the level of coordination, or lack thereof, among Federal agencies and programs. Could you please expand on your statement as to how the ARC Federal Co-Chair could help address this concern?

I share your belief that robust communication between agencies and programs is key to the effective use of development resources. The Office of the Federal Co-Chair is well-positioned to facilitate such interactions between state and local stakeholders and federal agencies and programs. If confirmed, I will ensure that open lines of communication are fostered by ARC.

The recent interagency work relating to green jobs and the economy is a good example of the role which ARC can play in the interagency process. The ARC career staff have been able to make timely and substantive contributions to the process.

To be successful in building on past work it is essential that we be alert, engaged, and assertive in ongoing policy reviews and interagency processes; be in a position to provide timely and valuable contributions to the ongoing policy process within the Administration and agencies; and be focused on helping to resolve issues and not concerned about who is credited for contributions.

Senator BOXER. Thank you.

OK, here is where we are. We have moved up the votes to 4 o'clock, Senators. Therefore, because we don't want to lose the TVA folks, I am going to ask if you could withhold your questions and please just put them in the record. We will make sure that they get answered before we have a meeting to move any of these nominees as well as the TVA. Is there objection to that? Because I'm worried that the TVA——

Senator CARDIN. I just want to make sure we will have a chance for the answers to put in the record before we are asked to vote.

Senator BOXER. Yes, that is what I said. We will not—until everybody has their questions answered in writing we won't move on any of these. I just don't want to run the risk of having our great TVA stalwarts now get trapped by a vote. Thank you. We will move forward.

Mr. Blitz.

STATEMENT OF SANDFORD BLITZ, NOMINATED TO BE FEDERAL COCHAIRPERSON, NORTHERN BORDER REGIONAL COMMISSION

Mr. BLITZ. Thank you, Chairman Boxer and members of the Environment and Public Works Committee. President Obama's submission of my nomination and my appearance here today before this august body is the greatest honor that has ever been bestowed upon me. Not only me, but to my family.

I am humbled by the confidence that has been shown in me and pledge to you that if confirmed, I will be sure to justify that confidence. And while I am speaking of family, the only family that was able to get here because of the weather is my wife, Mona, my partner for over 40 years.

Senator BOXER. Welcome.

Mr. BLITZ. My story is similar to others that have previously appeared before the Senate. That is to say, I am a second generation American. My maternal and paternal grandparents were born in Europe. My mother, very early in the lives of her children, became a single parent. Our mother, Ida Blitz, was the quintessential mother, protecting and nurturing her three children to allow them to grow to be productive citizens in society and to have their own families.

As a result of my mother's emphasis on the importance of an education I became the first member of my extended family to enter college and receive a degree. I am a native New Yorker who has lived and worked in New England since 1964. My employment career history includes working for the private sector for small and large corporations as well as being employed in the non-profit sector. In addition I created and operated my own consulting business for over 12 years.

However, the majority of my career has been spent in public service, and I must say the most satisfying of my vocational career. I am not going to go over that because you already heard it from the two Senators, and it will be in my statement that is entered into the record.

Senator BOXER. We will put it into the record.

Mr. BLITZ. Thank you. Thank you, Madam Chairman.

Throughout my Government career and my consulting business I have been involved in economic development issues and intergovernmental relations. As an adjunct assistant professor with the Department of Public Administration at the University of Maine, I teach graduate classes in economic development, intergovernmental relations and regional governance. All three of these courses are directly related to the work of the regional commission.

I have been focused on economic challenges faced by the Northern Border area for over 10 years and have witnessed how this region, which crosses four State boundaries, experiences common economic challenges. This is a region that is particularly well suited for the coordinated development approach pioneered by the Appalachian Regional Commission. I hope we can replicate many of the Commission's successes.

In November 2003 I set up a conference in Bangor, Maine, to encourage this type of regional development with the theme, The Emerging International Northeast: The Imperative, A Regional Coherence. Based on my years of economic development experience in the region, I am very encouraged by the potential that the Regional Commission will bring to the Northern Border States. I applaud the Congress for establishing this Commission.

Furthermore, I am honored to be nominated to be the first to hold the position of Federal Cochair of the Commission, if confirmed.

I believe that bringing Maine, New Hampshire, New York and Vermont together with the assistance of the Federal Government will result in far sighted, well conceived approaches to bring opportunity to the northern border. Additionally, at this time of increased economic distress the NBRC will be another vehicle with resources to assist in the creation of much-needed jobs in a region under enormous economic strain.

As I said earlier, I have worked for many years in the economic development field throughout New England. I am dedicated to finding effective economic strategies, improving public infrastructure as well as assisting private sector job creating initiatives. I believe that the Northern Border Regional Commission represents a unique and invaluable resource to improve the lives of all who live in this broad region. If confirmed I will spare no effort to ensure that the Commission fulfills this great promise.

Chairman Boxer and members of the committee, I appreciate this opportunity to appear before you and to familiarize you with my background. I look forward to responding to any questions that committee members may have.

[The prepared statement of Mr. Blitz follows:]

TESTIMONY OF
SANDFORD (SANDY) BLITZ
AT THE CONFIRMATION HEARING OF THE U.S. SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS IN REGARDS TO HIS PRESIDENTIAL NOMINATION TO BE THE FEDERAL CO-CHAIR OF THE NORTHERN BORDER REGIONAL COMMISSION
FEBRUARY 9, 2010

Chairman Boxer, Senator Inhofe, Members of the Environment and Public Works Committee, President Obama's submission of my nomination, and my appearance here today before this august body, is the greatest honor that has ever been bestowed upon me; not only me, but to my extended family. I am humbled by the confidence that has been shown in me, and pledge to you that, if confirmed, I will be sure to justify that confidence.

Speaking of my family, Chairman Boxer, I ask your permission to introduce those family members that were able to be here today to share this very significant event in our family's life.

My story is similar to others that have previously appeared before the Senate. That is to say, I am a second generation American; my maternal and paternal grandparents were born in Europe. My mother, very early in the lives of her children, became a single parent. Our mother, Ida Blitz, was the quintessential mother, protecting and nurturing her three children, to allow them to grow to be productive citizens in society, and to have their own families. As a result of my mother's emphasis on the importance of an education, I became the first member of my extended family to enter college and receive a degree.

I am a native New Yorker, who has lived and worked in New England since 1964.

My employment career history includes working in the private sector, for small and large corporations, as well as being employed in the non-profit sector. In addition, I created and operated my own consulting business for twelve (12) years. However, the majority of my career has been spent in public service, and I must say, the most satisfying of my vocational career.

Since 1971, when I became the Executive Assistant to the Mayor, City of Bridgeport, CT, I have worked with, and/or in the three levels of government. My federal career, which spans over 22 years, includes eight (8) years with the General Services Administration, thirteen (13) years with the Economic Development Administration, U.S. Department of Commerce, and most recently, fifteen (15) months with the Small Business Administration. I served in Washington, DC headquarters, in regional offices, and in the field.

Throughout my government career, and my consulting business, I have been involved in economic development issues and intergovernmental relations. As an Adjunct Assistant Professor, with the Department of Public Administration, at the University of Maine, I teach graduate courses in Economic Development, Intergovernmental Relations, and Regional Governance. All three of these courses are directly related to the work of Regional Commissions.

I have been focused on the economic challenges faced by the northern border area for over ten years, and have witnessed how this region – which crosses four state boundaries – experiences common economic challenges. This is a region that is particularly well suited for the coordinated development approach pioneered by the Appalachian Regional Commission, and I hope that we can replicate many of that Commission's successes. In November, 2003, I set up a conference to encourage this type of regional development with the theme *"The Emerging International Northeast: the Imperative of Regional Coherence."*

Based on my years of economic development experience in the region, I am very encouraged by the potential that the Regional Commission will bring to the Northern Border States, and I applaud Congress for establishing it. Furthermore, I am honored to be nominated to be the first to hold the position of federal Co-Chair the Commission.

I believe that bringing Maine, New Hampshire, New York, and Vermont together with the assistance of the Federal Government, will result in farsighted, well-conceived approaches to bring opportunity to the northern border. Additionally, at this time of increased economic distress, the NBRC will be another vehicle, with resources, to assist in the creation of much needed jobs, in a region under enormous economic strain.

As I said earlier, I have worked for many years in the economic development field throughout New England, and I am dedicated to finding effective economic strategies, improving public infrastructure, as well as assisting private sector job creating initiatives. I believe that the Northern Border Regional Commission represents a unique and invaluable resource to improve the lives of all who live in this broad region. If confirmed, I will spare no effort to ensure that the Commission fulfills its great promise.

Chairman Boxer, Members of the Committee, I appreciate this opportunity to appear before you, and familiarize you with my background. I look forward to responding to any questions the Committee Members may have.

Environment and Public Works Committee Hearing of
February 9, 2010
Follow-Up Questions for Written Submission by
Sandford Blitz, Nominee for Federal Co Chair
Northern Border Regional Commission
February 23, 2010

Questions for Blitz

Questions from:

Senator Barbara Boxer

1. A number of studies have identified strong resources for wind power in many parts of the northern border region. Do you see renewable and alternative energies as a job creator and part of your development strategies?

Businesses and residents of the northeast region of the United States are more reliant on fossil fuel heating oil than any other section of the country. High energy costs, for many years, have been a drag on the economies of the northern tiers of Maine, New Hampshire, New York and Vermont. If confirmed, I would encourage the continued development of renewable and alternative energy strategies and projects, as the governors of the northern Border Region are already pursuing. These types of energy development will not only bring "home-grown" energy to the region, but also will create new, sustainable jobs.

My belief is that if the Northern Border Region is to improve the economic life of its people, it must lower energy costs, and also create manufacturing jobs in areas of the economy that have a future. The renewable energy and alternative energy sector of the economy will do both.

2. The legislation creating the Northern Border Regional Commission seeks to further economic development across a four-state region. It also identifies priorities that include resource conservation and open space preservation. How do you balance those two needs - economic development and conservation?

Much of the Northern Border Region's economy is based on natural resources, such as farming, forestry, fisheries, marine resources, and tourism. If these major sectors of the region's economy are to sustain themselves, there needs to be a protective conservation element. Some such conservation elements exist now, and have been successful at conserving resources while driving the *regional economy.*

For example, anti-clear cutting and other conservation measures, both imposed by law and industry-initiated, have served to sustain the North Woods, which covers the four states of the Northern Border Region. This is the largest, privately held, sustained forest in the United States, and is a major sector of the Northern Border Region's economy.

In another example, the Maine Lobsterman's Association for many years has had a "strong conservation and stewardship ethic" that has not only sustained the industry, but, has allowed it to grow. Such measures as size limits, trap limits, protection of egg bearing lobsters, and controlling entrance of new lobsterman, have seen lobster landings increase from 30 million pounds in 1990 to 70 million pounds in 2005.

Environment and Public Works Committee Hearing of
February 9, 2010
Follow-Up Questions for Written Submission by
Sandford Blitz, Nominee for Federal Co Chair
Northern Border Regional Commission
February 23, 2010

Question from:

Senator James M. Inhofe

1. Mr. Blitz, your extensive background in economic development issues, specifically in the northern border region, as well as working in and with Federal, State and local governments, should serve you well in your appointment. As I mentioned in my opening statement, though, you will have the added challenge of guiding this program from its very beginning. Could you please discuss any previous experiences you've had that you will draw upon, and how you plan to address, the initial challenges of the Northern Border Regional Commission?

As you have indicated, my previous experience has given me familiarity with the economic conditions of the Northern Border Region. However, my years of service have also given me the tools I will need, if confirmed, to work with the northern border states to establish the Commission. During the time that I was employed at the General Services Administration (GSA), I became very familiar with federal government personnel and space regulations. If confirmed, I will work with GSA to quickly get the resources the Commission needs to function. I also have experience with staffing and setting policy for an office. As the Executive Assistant to the Mayor of Bridgeport, CT, I was involved in staffing of the incoming municipal Administration, and the development of policy and program direction.

After initial staffing and office needs are met, the Commission will need to develop and implement a procedure to award grants prior to September 30, 2010. Having been involved in grant award programs since 1983, I am very confident that, if confirmed, I can meet this challenge.

Finally, of critical importance to the success of the Commission will be obtaining future years' funding. There are only seven months left in the federal fiscal calendar, and budget and appropriation considerations are now moving through the Congress for FY2011. Throughout my career I have had numerous occasions to work with Senators, Members of the House, and congressional committees. If confirmed, I will need to immediately begin reaching out to Congress to obtain funding for the Commission for the next fiscal year.

Senator BOXER. Thank you so much.

Gentlemen, I am going to go down the row. I have certain questions I have to ask you for the record. I will just go down the row.

Do you agree, if confirmed by the Senate, to appear before this committee or designated members of this committee and other appropriate committees of the Congress and provide information, subject to appropriate and necessary security protection, with respect to your responsibilities?

Mr. Elkins.

Mr. ELKINS. Yes, ma'am.

Mr. BLITZ. Yes.

Mr. GOHL. Yes.

Senator BOXER. All right. Do you agree to ensure that testimony, briefings, documents and electronic and other forms of communication are provided to this committee and its staff and other appropriate committees in a timely fashion?

Mr. ELKINS. Yes, I do.

Mr. GOHL. Yes.

Mr. BLITZ. Yes.

Senator BOXER. Do you know of any matters which you may or may not have disclosed that might place you in any conflict of interest if you are confirmed?

Mr. ELKINS. No.

Mr. GOHL. No.

Mr. BLITZ. None.

Senator BOXER. All right. We want to just thank you very, very much. We will get you some questions. But in the meantime, get home safely, and thank you very much.

We will ask our TVA panel to come up at this time.

[Pause.]

Senator BOXER. I am going to ask if the panel could take its seat because we have to make sure that we are out of here around 10 after 4 so that we can make our votes.

I am very pleased to convene this hearing on the nominations of Marilyn Brown, Barbara Haskew, Neil McBride and William Sansom to the board of the Tennessee Valley Authority.

The Tennessee Valley Authority is a critical piece of our Nation's energy policy. In 1933 it was an ambitious, unprecedented and successful Government effort to improve a deeply impoverished area. Its mandate is to be a national leader in technological innovation, low cost power and environmental stewardship. I want to repeat that. You have a mandate in three areas: technological innovation, low cost power and environmental stewardship.

In 2010 that mandate is even more important. Our Nation is on the brink of tremendous energy and environmental opportunities. If our Nation acts now to develop and manufacture clean energy technologies, and we do it right, I believe our communities, our families, our health and our economy will all benefit.

The tragic coal ash disaster at TVA Kingston fossil plant over a year ago highlighted some of the hidden costs to public health and safety and the need to rethink how a utility should be managed in the 21st century. So you will be there at a time of great opportunity and challenge.

I believe TVA's board must help to lead the way in developing and using clean energy technologies, must ensure that TVA does not repeat the mistakes of the past, and must do everything it can to make the people affected by the spill and its aftermath whole. We have met—I know Senator Alexander has and I have—some of the people that were dislocated as a result of that tragic episode.

I believe that TVA should also increase its commitment to its core mission, or the missions. I look forward to hearing from you about how specifically you view your mission on those three areas, low cost power, technology innovation and environmental stewardship.

[The prepared statement of Senator Boxer follows:]

STATEMENT OF HON. BARBARA BOXER,
U.S. SENATOR FROM THE STATE OF CALIFORNIA

I am very pleased to convene this hearing on the nomination of Marilyn A. Brown, Barbara S. Haskew, Neil G. McBride and William B. Sansom to the Board of the Tennessee Valley Authority (TVA).

The Tennessee Valley Authority is a critical piece of our Nation's energy policy. In 1933, it was an ambitious, unprecedented and successful Government effort to improve a deeply impoverished area. Its mandate is to be a national leader in technological innovation, low cost power, and environmental stewardship.

In 2010, that mandate is even more important. Our Nation is on the brink of tremendous energy and environmental opportunities that can create new jobs and economic growth in our country. If our Nation acts now to develop and manufacture clean energy technologies, our communities, our families, our health and our economy will all benefit.

The tragic coal ash disaster at the TVA Kingston Fossil Plant over a year ago highlighted some of the hidden costs to public health and safety from fossil fuel based energy and the need to rethink how a utility should be managed in the 21st century.

I believe that the TVA's Board must help to lead the way in developing and using clean energy technologies, must ensure that TVA does not repeat the mistakes of the past, and it must do everything that it can to make the people affected by the spill and its aftermath whole. The TVA must also increase its commitment to its core mission of environmental stewardship and to protecting the health and safety of all communities affected by its operations.

I look forward to hearing from the nominees about specifically how they would help to guide TVA to achieve its mission of being a national leader in low cost power, technological innovation and environmental stewardship.

Senator BOXER. In the remaining time, I am going to put into the record a statement by Senator Carper. He wanted me to tell you this, that he very much wanted to attend the hearing, as he is the Chairman of the Senate Subcommittee, of this committee's Subcommittee on Clean Air and Nuclear Safety, which oversees the TVA. Unfortunately, he is detained in a meeting that has long been scheduled, and he will probably not attend, although he is trying to. Senator Carper wanted me to tell you he shares my view that the TVA should be a leader in our clean energy economy, and not a lagger. These nominees before us today can help change the culture at the TVA. He looks forward to meeting all of the TVA nominees in person, and he will have questions for the record.

With that I will call on Senator Alexander.

Senator ALEXANDER. Madam Chair, I thank you for your comments, and I welcome the witnesses. I said most of what I had to say a little earlier.

We had a hearing this morning at which there was a lot of head nodding around this table from both Democrats and Republicans about the President's three nominees for the Nuclear Regulatory

Commission. They each seem exceptionally well qualified. And the Tennessee Valley Authority at the moment is the Nation's leader in construction of new nuclear power plants.

The reason I was encouraged by the nominees this morning was because of a series of actions that President Obama has taken in the last several weeks, which are extremely important. One is the President said in his State of the Union address that he looks forward to a new generation of safe, clean nuclear reactors. That is important, because the Government is not going to build any nuclear reactors. The utilities are going to build them, and the ratepayers are going to help pay for them. We might help them get started a little bit. But the Presidential leadership is key.

The President also appointed a number of outstanding members to a new commission that would deal with what to do with used nuclear fuel. The Nuclear Regulatory Commission today says it can be stored safely onsite for maybe 60 or maybe 80 years. But we need a better way to recycle the fuel than we now have today. So we ought to take the time to do that well and not be content with, for example, what France does.

The President also endorsed $54 billion of support for loan guarantees for new nuclear power plants. I favor that, although to be consistent I would prefer that the loan guarantees be for any low carbon energy because I would like to see us move away from a production tax credit for wind and an investment tax credit for solar and a renewable energy standard that just has a few sorts of clean energy. I would like to see us focus on all clean energy and recognize that in different parts of the country one thing may be appropriate here, another thing may cost less here.

The President also has appointed an Energy Secretary who fully understands nuclear energy and has helped our Government take good, sound steps in the right direction. So we have a long way to go. But TVA, as the Chair said, is a unique agency. It is a Federal agency. It has a responsibility to be a leader in things that help our country, and one of those is clean energy. And from my point of view, and as we get to questions, if I don't have time I will put them in writing, because I have discussed them with each of you, the by far most appropriate clean energy for our region is nuclear power. We know how to do it. It would be hard to make a mistake building it because coal plants are going to come under increasing pressure, and we are going to need electricity. Even if we reduce—we talk a lot about conservation and efficiency, which all of us support. And I hope you can make great strides on that, about electric cars, which all of us support. Tennessee ought to be the center of that.

So I hope your creativity is directed toward making Tennessee Valley a leader in the use of electric cars, in conservation and efficiency. But to maintain that leadership in helping this Nation produce nuclear energy again. That will help us have low cost power in the region, and it will help us have clean air and carbon free air.

I thank the Chair, and I will save any other remarks for questions.

Senator BOXER. Thank you.

I am going to start with Ms. Brown, and we will go down. If you can each keep to 5 minutes, then we will get out of here just at the time the vote starts. And then you can get safely to your aircraft, I hope.

Go ahead.

STATEMENT OF MARILYN A. BROWN, NOMINATED TO BE A MEMBER, BOARD OF DIRECTORS, TENNESSEE VALLEY AUTHORITY

Ms. BROWN. Thank you very much, Madam Chair and Senator Alexander. It is an honor to appear before you as a nominee to the Tennessee Valley Board of Directors. I truly appreciate being nominated by President Obama, and I am grateful for the committee's consideration of my candidacy.

I would also like to acknowledge my daughter, Katie Southworth, who is here. Katie, would you raise your hand? She is a new graduate of the University of Tennessee College of Law.

I approach my nomination with tremendous esteem for the Tennessee Valley Authority and what the institution represents. The Tennessee Valley is a land of opportunities. It is rich with resources, abundant in beauty and blessed with a unique history and tradition. TVA is an essential part of that history and continues to occupy a critical role in the lives of Valley residents and the regional economy.

You have before you in my written testimony the details of my career. I am not going to reiterate those; rather I am going to fast forward to 2006 which is when I left Oak Ridge National Laboratory, after 22 years working in and eventually leading their energy efficiency and renewable energy program. Since moving from Oak Ridge to Atlanta, where I teach at the George Institute of Technology, my concern for the energy challenges facing the southeast and the Nation have grown. Consumption of electricity is increasing rapidly, particularly during periods of peak demand. While efforts to manage the growing appetite for energy are often inadequate I am confident that a variety of practical solutions are available to manage TVA's growing demand while ensuring reasonable prices, reliable service, responsible environmental practices and economic growth.

The challenge of energy security also looms large. And in that case electricity markets and policies can also provide solutions. TVA and other electric utilities can make the region and the country more secure by using its off-peak electricity to electrify cars, and by using plug-in vehicles to back up the grid. So loss of opportunities, just as TVA has converted challenges into opportunities in its past, TVA can contribute to bringing opportunities to the Tennessee Valley today.

If confirmed I commit to working closely with you and my fellow board members to promote TVA's energy, environmental and economic mission. I look forward to answering any questions you have perhaps later in writing. Thank you.

[The prepared statement of Ms. Brown follows:]

Statement of
Marilyn A. Brown
Nominee to the Tennessee Valley Authority Board of Directors
Before the
U. S. Senate Committee on Environment and Public Works
February 10, 2010

Madam Chair, Ranking Member Inhofe and Members of the Committee, it is an honor to appear before you as a Nominee to the Tennessee Valley Authority Board of Directors. I am truly thankful for, and humbled by, your consideration of my nomination. Thank you. I would also like to both thank and introduce to the Committee a family member who is here with me today to provide her support: my daughter, and recent graduate of the University of Tennessee College of Law, Katie Southworth.

I approach my nomination with tremendous esteem for the Tennessee Valley Authority and what the institution represents. The Tennessee Valley is a land of opportunities. It is rich with resources, abundant in beauty, and blessed with a unique history and tradition. TVA is an essential part of that history, and continues to occupy a critical role in the lives of Valley residents and the regional economy.

Madam Chair, as I seek your support, and the support of your esteemed colleagues, I am mindful of TVA's mission: to serve the Tennessee Valley through energy, the environment, and economic development.

Over three decades, I have conducted research on the electric power industry, focusing on the policies and programs used by utilities both nationwide and internationally to foster the use of sustainable energy technologies. At Oak Ridge National Laboratory in Oak Ridge, Tennessee, I co-led the report, *Scenarios for a Clean Energy Future,* which remains a cornerstone of engineering-economic analysis of sustainable energy options for the United States.

As Director of the Energy Efficiency and Renewable Energy Program at Oak Ridge, I managed programs to develop advanced technologies, including heat pump water heaters, hybrid solar lighting systems, high-temperature industrial materials, and superconducting power transmission cables. These efforts have enhanced the energy productivity of homes, commercial buildings, industrial facilities and our nation's electric grid.

During my years in Oak Ridge, I had the privilege of collaborating with the talented and dedicated staff at TVA and was stimulated by my interactions with TVA Board members.

Since moving to the Georgia Institute of Technology in 2006 to become a Professor of energy policy, my concern for the energy challenges facing the Southeast and the Nation has grown. Consumption of electricity is increasing, particularly during periods of peak demand, while efforts to manage the growing appetite for electricity are often inadequate.

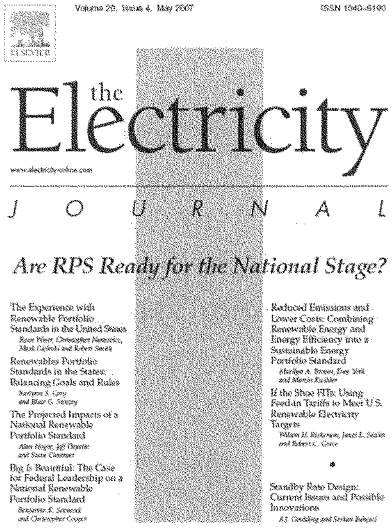
I am confident that a variety of practical solutions are available to manage TVA's growing demand while ensuring reasonable prices, reliable service, responsible environmental practices and economic growth. In addition to new power generation, possible solutions include time-of-use pricing, industrial combined heat and power policies, integrated resource planning, and the coupling of return on investment with the provision of energy services, not just electricity sales.

The challenge of energy security looms large, and in this case, electricity markets and policies also can offer solutions. TVA and other electric utilities can make the region and the country more secure by using its off-peak electricity to electrify cars and by using plug-in vehicles to back up the grid.

Just as TVA converted challenges into opportunities in its past, TVA can continue to bring opportunities to the Tennessee Valley today. If confirmed, I commit to working closely with you and my fellow Board members to promote TVA's energy, environmental, and economic mission.

I look forward to answering any questions you might have. Thank you.

Provided for non-commercial research and educational use only.
Not for reproduction or distribution or commercial use.



Volume 20, Issue 4, May 2007
ISSN 1040-6190

ELSEVIER

the Electricity JOURNAL

www.electricity-online.com

Are RPS Ready for the National Stage?

The Experience with Renewable Portfolio Standards in the United States
Ryan Wiser, Christopher Namovicz, Mark Gielecki and Robert Smith

Renewables Portfolio Standards in the States: Balancing Goals and Rules
Kathryn S. Cory and Blair G. Swezey

The Projected Impacts of a National Renewable Portfolio Standard
Alan Nogee, Jeff Deyette and Steve Clemmer

Big Is Beautiful: The Case for Federal Leadership on a National Renewable Portfolio Standard
Benjamin K. Sovacool and Christopher Cooper

Reduced Emissions and Lower Costs: Combining Renewable Energy and Energy Efficiency into a Sustainable Energy Portfolio Standard
Marilyn A. Brown, Dan York and Martin Kushler

If the Shoe FITs: Using Feed-in Tariffs to Meet U.S. Renewable Electricity Targets
Wilson H. Rickerson, Janet L. Sawin and Robert C. Grace

•

Standby Rate Design: Current Issues and Possible Innovations
A.J. Goulding and Serkan Bahceci

This article was originally published in a journal published by Elsevier, and the attached copy is provided by Elsevier for the author's benefit and for the benefit of the author's institution, for non-commercial research and educational use including without limitation use in instruction at your institution, sending it to specific colleagues that you know, and providing a copy to your institution's administrator.

All other uses, reproduction and distribution, including without limitation commercial reprints, selling or licensing copies or access, or posting on open internet sites, your personal or institution's website or repository, are prohibited. For exceptions, permission may be sought for such use through Elsevier's permissions site at:

http://www.elsevier.com/locate/permissionusematerial

Reduced Emissions and Lower Costs: Combining Renewable Energy and Energy Efficiency into a Sustainable Energy Portfolio Standard

Combining renewable energy and energy efficiency in Sustainable Energy Portfolio Standard (SEPS) has emerged as a key state and national policy option to achieve greater levels of sustainable energy resources with maximum economic efficiency and equity. One advantage of the SEPS relative to a renewable portfolio standard or a stand-alone energy efficiency resource standard is enhanced flexibility and broader options for meeting targets.

Marilyn A. Brown, Dan York and Martin Kushler

Marilyn A. Brown *is a Professor of Energy Policy in the School of Public Policy at the Georgia Institute of Technology, where she teaches courses on energy policy and technology and is also a visiting distinguished scientist at Oak Ridge National Laboratory. She recently completed an evaluation of the U.S. Climate Change Technology Program's R&D agenda and is currently working with DOE on a climate technology deployment strategy R&D portfolio and co-edited the recently published book* Energy and American Society: Thirteen Myths *(Springer).*

Dan York *is the Senior Research Associate in the Utilities Program at the American Council for an Energy Efficient Economy (ACEEE), a non-profit organization founded in 1980 and dedicated to energy efficiency research and policy development. He has been involved in many national research efforts in this subject area.*

Martin Kushler *is Director of the Utilities Program at ACEEE, and leads ACEEE's research efforts in the area of utility-sector energy efficiency policies and programs.*

Valuable review comments were provided by Bill Prindle (ACEEE), Bob Hawsey (Oak Ridge National Laboratory), and Benjamin Sovacool (Virginia Institute of Technology).

I. Introduction

Almost two years after passage of the Energy Policy Act of 2005, there is a strong movement afoot to address the unfinished business of setting clean energy goals for the electricity industry. The Senate's approach to that challenge in 2005 was promulgating a national Renewable Portfolio Standard (RPS). A national RPS was nearly incorporated into EPAct, and it is again under serious consideration. So the time is indeed ripe for a rigorous evaluation of clean energy goals in the electricity industry and to consider the pros and cons of alternatives.

1040-6190/$–see front matter © 2007 Elsevier Inc. All rights reserved., doi:/10.1016/j.tej.2007.03.005

As with any federal policy, there will be winners and losers of a national RPS. Indeed, those states with limited renewable resources see the RPS as an economic development program for everyone else and anticipate rate increases for themselves. Energy efficiency advocates, on the other hand, are wondering how they were left out of the debate. Energy efficiency is widely viewed as the fastest, cheapest, and cleanest energy resource, so if the goal of federal legislation is to develop clean energy resources, shouldn't energy efficiency be included?

Among the 23 states with an RPS, Hawaii, Nevada, and Pennsylvania have expanded the scope of their qualifying energy resources to include energy efficiency. Other states, including Colorado, California, Texas, and Vermont, have set efficiency targets in parallel with RPS, and Minnesota, Illinois, New Jersey, and Massachusetts are considering such policies. These states recognize that by broadening the eligible clean energy resource mix, the economic efficiency of meeting resource targets can be maximized and costs minimized. In addition, equity is advanced: investor-owned utilities serving regions of a state with scarce renewable resources can place relatively more emphasis on energy efficiency than utilities operating in resource-rich regions. Lastly, allowing for a renewable energy and energy efficiency mix enhances the flexibility with which states can meet overall sustainable energy goals. These same economic efficiency, equity, and flexibility arguments apply at a national scale. Thus, it is time to consider promulgating a national Sustainable Energy Portfolio Standard (SEPS) as an extension of the RPS concept.

If the goal of federal legislation is to develop clean energy resources, shouldn't energy efficiency be included?

II. Resource and Technology Options for a Sustainable Energy Portfolio Standard

Much of the current motivation for renewable portfolio standards appears to derive from a concern about the pollution and greenhouse gas emissions associated with fossil power production, especially low-efficiency pulverized coal plants (relative to supercritical and integrated gasification combined-cycle plants) that account for much of the nation's electricity production. We agree with the almost uniform opinion of economists that "markets should be left alone by government unless market failures are discovered."[1] The "market-failure model" guiding public policy debates today does indeed apply here. Because the price of fossil energy does not reflect an array of external costs including those caused by the emission of carbon dioxide, they provide an artificially low price against which alternatives find it difficult to compete. Prices are giving false signals and are confounding the communication between consumers and producers.[2] In such settings, when prices do not accurately reflect total costs, it is legitimate to consider public intervention. However, the existence of market failures is not a sufficient justification for government involvement. Feasible, low-cost policies must also be available that can eliminate or compensate for these market failures and do so at a cost that does not exceed its benefits.[3]

We believe that an appropriately designed national Sustainable Energy Portfolio Standard could be fully justified and would be beneficial to the country, based on this line of reasoning. By including a broader array of qualifying resources and technologies, it would also be economically more efficient and more equitable than a national Renewable Portfolio Standard as currently proposed.

The problem is that the geography of renewable energy resources is very uneven. A recent report published by the American

1040-6190/$–see front matter © 2007 Elsevier Inc. All rights reserved., doi:/10.1016/j.tej.2007.03.005

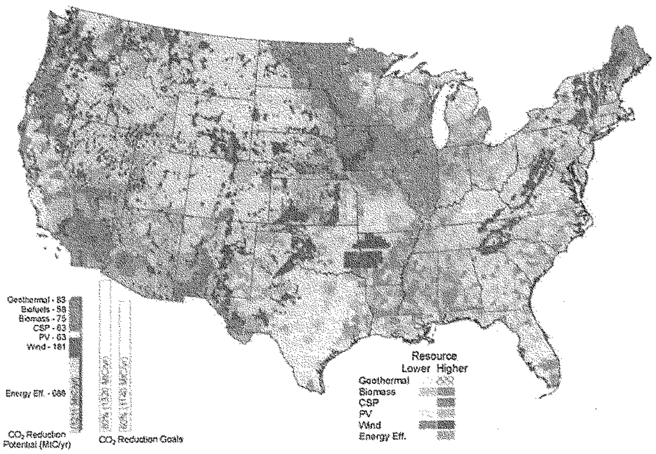


Figure 1: Potential Carbon Reductions from Energy Efficiency and Renewable Energy Resources by 2030[6]

Solar Energy Society[4] provides detailed renewable resource maps for the United States, based primarily on work done by the National Renewable Energy Laboratory. **Figure 1** summarizes the results, framed in an analysis of the potential CO_2 reductions that could be contributed by renewable energy and energy efficiency by 2030 on a county-by-county or similar sub-region basis.[5,6]

According to the wind resource map shown in Kutscher,[7] Louisiana, Missouri, and nine states east of the Mississippi River do not have any sub-regions with high wind resources (i.e., class 4 or higher wind). According to the biomass resource map,[8] six states ranging from Virginia to Massachusetts (along with Utah and New Mexico) do not have any sub-regions with at least 250,000 metric tons of currently available biomass/year.[9] Finally, the map of solar resources[10] shows that with the exception of Florida the eastern half of the United States is devoid of sub-regions capable of producing 6.0 kWh/m^2/day using photovoltaics on south-facing surfaces. By contrast, energy efficiency is consistently available in substantial amounts in every state, especially in the buildings sector, which accounts for about 40 percent of total U.S. carbon emissions.[11] As Figure 1 shows, efficiency resources equal about half of the total greenhouse gas reduction potential over the next 25 years. Thus, by adding energy efficiency to the resource mix, the distribution of renewable and efficiency resources is much more dispersed, and every state would have at least one high-potential option.

The available energy efficiency resources are well documented and significant. A study conducted by staff from five DOE National Laboratories estimated that an aggressive set of policies implemented in the year 2000 could cut the nation's primary energy used for producing electricity in 2020 by 24 percent, relative to a business-as-usual case.[12] The result of such an effort was estimated to be a savings of 10 quads of energy in the electric sector, with no net cost to the economy. A recently published report for the Western Governors' Association reached a comparable conclusion.[13] Similarly, Nadel,

1040-6190/$-see front matter © 2007 Elsevier Inc. All rights reserved., doi:/10.1016/j.tej.2007.03.005

Shipley, and Elliott[14] conducted a national review of nearly a dozen state and regional energy efficiency potential studies and found that the median level of estimated achievable potential was 1.2 percent per year for electricity.

These studies of energy efficiency potential have been complemented by a growing body of assessments concluding that a utility company can rely on the energy savings from an energy efficiency program as part of their resource procurement plan with the same level of confidence as they rely on the output from a power plant. Indeed, in a modeling study that assessed the contribution of energy efficiency programs to a utility's resource portfolio, Hirst[15] found that energy efficiency programs generally reduced uncertainties and that the resource portfolio with energy efficiency programs was less sensitive to changes in economic growth, fuel prices, and the capital costs of power plants than was a supply-only portfolio. In a recent review of the literature, Vine, Kushler, and York[16] conclude that "energy savings from energy efficiency programs are sufficiently reliable, predictable, and enforceable to allow energy efficiency to be incorporated as a utility system resource." Unfortunately, a variety of barriers including the coupling of electric utility profits to electricity sales in many states hinder greater investment in cost-effective energy efficiency.[17]

A Sustainable Energy Portfolio Standard should let the market choose what low-carbon technologies are preferable at any point in time.

Numerous energy resources and technologies in addition to renewable energy and energy efficiency can also offer pollution and GHG emission reductions. For instance, integrated gasification combined cycle coal plants with carbon capture and sequestration show promise, as well as a new generation of nuclear power and stationary hydrogen fuel cells, to name a few. Others are described in the U.S. Climate Change Technology Program's *Strategic Plan.*[18] A Sustainable Energy Portfolio Standard should let the market choose what low-carbon technologies are preferable at any point in time, within the rules established by a national SEPS. However, in light of today's "supply curve" for energy alternatives, near-term SEPS targets would likely be met by a combination of renewable resources and energy efficiency.

In keeping with the goal of broadening the base of options, the energy efficiency resource category should include options such as distribution system efficiency improvements, combined heat and power (CHP), and other technologies to re-use heat as well as demand-side management and load shifting. An output based performance metric such as maximum grams of CO_2 per kilowatt-hour of electricity supplied could define the standard's eligible resources; then the market could determine the ultimate mix.

III. Experiences to Date with Sustainable Energy Portfolio Standards

Combined energy efficiency/renewable energy performance standards – i.e., "Sustainable Energy Portfolio Standards" – are outcome-based policies that involve setting targets to be achieved for energy savings and renewable resources for selected future years or periods. As with an RPS, achieving the targets can be accomplished via numerous models of program administration and implementation, including utility-based programs and non-utility public benefits programs. Through SEPS it is possible to create market structures that would allow trading among affected and/or eligible parties, which could include non-utility providers of renewable energy resources and energy efficiency services.

This article examines the SEPS that have been enacted in Hawaii, Pennsylvania, and Nevada **(Figure 2)**. **Table 1** describes some

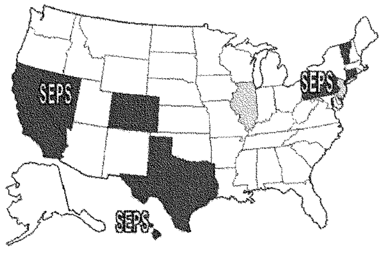


Figure 2: States With Sustainable Energy Portfolio Standards (Note: SEPS denotes states with an SEPS, black states currently have an energy efficient resource standard, and light gray states have a pending EERS)[20]

of their key features and illustrates the diversity across states. The following description of each of these three programs has been updated from material presented in Nadel.[19]

Hawaii was the first state to establish a clean energy portfolio standard that combined renewable and energy efficiency resources. Like Nevada, it first had an RPS, which it then expanded to include energy efficiency. Pennsylvania, on the other hand, began by establishing an alternative energy portfolio standard, mixing energy efficiency and renewable resources into a combined program.

Hawaii's initial 2001 statute was limited to renewable resources, with requirements beginning in 2003. In 2004, this was modified by Act 95 to include energy efficiency. As amended, the law sets a renewable resource requirement of 8 percent of kWh sales in 2005, rising to 20 percent in 2020. Efficiency qualifies as a resource under these requirements with no cap on energy efficiency savings. Combined heat and power and use

Table 1: States with Sustainable Energy Portfolio Standards[21]

State	SEPS Description	Applies to	Savings Target (TL = Total Load; LG = Load Growth)	Timeframe
Hawaii	Allows efficiency to qualify as a resource under RPS requirements.	Investor-owned utilities	Up to 20% of kWh sales (TL)[a]	2020
Pennsylvania	Includes energy efficiency as part of a two-tier alternative energy portfolio standard. There is no minimum for the energy efficiency portion of the resource mix. Targets are given as a percentage of sales.	Investor-owned utilities	Up to 4.2% (TL) Up to 6.2% (TL) Up to 8.2% (TL) Up to 10.0% (TL)	Years 1–4 Years 5–9 Years 10–14 Years 15 and thereafter
Nevada	Redefines portfolio standard to include energy efficiency as well as renewable energy. Targets are given as a percentage of sales.	Investor-owned utilities	Energy efficiency can meet *up to 25%* of the energy provider's portfolio standard:	
			6% – EE up to 1.5% (TL)	2005–2006
			9% – EE up to 2.25% (TL)	2007–2008
			12% – EE up to 3% (TL)	2009–2010
			15% – EE up to 3.75% (TL)	2011–2012
			18% – EE up to 4.5 % (TL)	2013–2014
			20% – EE up to 5% (TL)	2015 and thereafter

[a] Overall RPS target, EE (%) not specified.

1040-6190/$-see front matter © 2007 Elsevier Inc. All rights reserved., doi:/10.1016/j.tej.2007.03.005

of rejected heat in industrial facilities are also eligible. For both renewables and efficiency, resources developed before the program began count towards the targets as long as they are providing energy or savings. Hawaiian utilities have been offering energy efficiency programs for many years and advocated for a combined program. Utility support for energy efficiency is aided by lost revenue recovery provisions in utility commission regulations.

The two major utilities (Hawaiian Electric Company, Inc. and Kauai Island Utility Cooperative) evaluate savings from their program annually and submit a report to the Hawaii Public Utilities Commission for review. In 2004, according to reports filed by Hawaii's utilities, renewable energy and energy efficiency resources accounted for about 11 percent of electricity sales, with renewables accounting for 68 percent of these resources and efficiency 32 percent. The data submitted by affected utilities for 2005 show some slight changes, with almost 12 percent of total sales attributable to renewables and energy efficiency resources. Of this total 65 percent were renewable resources and 35 percent energy efficiency resources. Most of the energy efficiency resources (90 percent) come from "pre-2005" program participants; 10 percent are from 2005 participants. The utilities' status reports note that while the 2005 targets are being met, the 2020 targets may be hard to meet without increasing energy efficiency and renewable energy efforts given projected load growth, some problems with existing renewable generation systems, and delays in developing new projects.[22]

Pennsylvania was the second state to establish a sustainable energy resource standard.

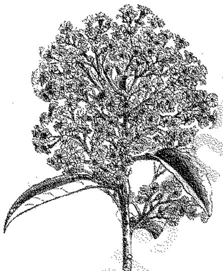
Implemented through the Alternative Energy Portfolio Standards Act of 2004, demand-side management, energy efficiency and load management programs and technologies are among the resources eligible for participation in Pennsylvania's alternative energy market. Under the law, renewable energy must account for 8 percent of the power sold in the state after 15 years of implementation, with lower thresholds for earlier years. In addition, "tier 2" advanced energy resources must account for an additional 4.2 percent of power sold starting in 2006, 6.25 in 2011, 8.2 percent in 2016, and 10 percent in 2021. "Tier 2" resources include energy efficiency, hydropower, waste coal generation, and municipal solid waste. Pennsylvania's standards will not have much immediate or near-term impact on utility resource portfolios, however, until the period 2009-11, at which time the utilities will have fully recovered stranded costs associated with restructuring. Until such costs are recovered, affected utilities are not required to fulfill renewable and demand-side resource credits mandated in the Act. Utilities serving roughly 80–90 percent of load fall into this category. Only a couple of very small utilities will be affected by the Alternative Energy Portfolio Standards before that period.

The Pennsylvania Public Utilities Commission (PPUC) developed implementing regulations that divide energy efficiency measures into two categories: those that are relatively easy to characterize for which a "deemed savings" approach can be used and more complex measures that require either metering (such as distributed generation) or custom calculations. For the deemed savings approach, the PPUC, working with interested parties, developed a Technical Reference Manual (TRM) that includes algorithms for calculating savings from residential, HVAC, lighting, and appliance measures and commercial and industrial HVAC, motor, and lighting measures. The PPUC also noted that "other technologies may be added to the TRM over time to provide a common reference for claiming electricity savings."[23]

Because of the many existing hydroelectric, waste coal, and municipal solid waste generating plants in operation that in 2003 accounted for about 8 percent of statewide electricity use, new tier 2 resources will only be needed to meet post-2016 targets. When the legislation was passed, numbers were changing quickly and no one really knew how the tier 2 targets related to existing resources.[24]

The **Nevada** SEPS grew out of an RPS, which was established in 2001 by the Nevada legislature, requiring that 15 percent of the state's electricity come from renewable sources by 2013. In 2005, this law was amended by Assembly Bill 3 to increase the portfolio requirement to 20 percent of 2015 sales, but also to allow the utilities to use energy efficiency programs to meet up to 25 percent of the requirements. The law requires at least half of the energy efficiency savings to come from the residential sector, unless the Nevada Public Utility Commission (NPUC) approves a different proportion. These amendments were agreed to after the utilities had difficulty meeting the renewables-only requirement during the first two years of implementation.

In February 2006, the NPUC issued a revised adopted regulation for the SEPS, allowing utilities to operate energy efficiency programs themselves or to purchase credits from third parties under contract.[25] The utilities propose procedures for measurement and verification of energy efficiency savings based on prior NPUC directives. The NPUC reviews and approves credit verification submissions, and the utilities report quarterly to the NPUC on portfolio goals and credits earned. Extra credits may be rolled over to future years. If a utility does not meet its portfolio goals, it is subject to fines and administrative sanctions, although the NPUC can waive these if it determines that there was not a sufficient supply of renewable energy or energy efficiency resources available for purchase.



Nevada's two major utilities (Nevada Power Co. and Sierra Pacific Power Co.) have been operating some efficiency programs for a number of years, but with passage of this new law and related policy developments such as enactment of a shareholder incentive structure for energy efficiency investments, they plan to greatly increase their efforts, as evidenced by increasing spending on efficiency programs from about $16 million in 2005 to $30 million in 2006.[26] These funds are included in electric rates. Energy efficiency savings began counting toward portfolio credits in 2006; results are not yet available as to achievements in this program year. The utilities are on record as saying they want to maximize energy efficiency savings allowed under the law (i.e., 25 percent of the SEPS goal). In order to reach this goal, they are considering a significant increase in energy efficiency funding for 2007-09, perhaps to as much as double the 2006 funding level. Proposed funding levels must be formally filed with and approved by the NPUC.[27]

IV. Experiences to Date with Energy Efficiency Resource Standards

Five states have established stand-alone energy efficiency resource standards (EERS) to complement their RPS. The diversity in approaches and structures in place to achieve targeted performance levels for energy efficiency is illustrated in **Table 2**. In each case, the EERS emerged as a conceptual parallel to RPS, with established timetables for achieving specific resource goals or targets—in this case via energy efficiency savings instead of renewable energy. Like an RPS and a SERS, an EERS can include market-oriented mechanisms, such as the flexibility to achieve the target through a market-based trading system.

Table 2: States with Current or Pending Energy Efficiency Resource Standards[29]

State	EEPS Description	Applies to	Savings Target (TL = Total Load; LG = Load Growth)	Timeframe
California	Sets specific energy and demand savings goals.	Investor-owned utilities	Annual MWh, MW, and therm savings goals set for each program year from 2004 to 2013. For 2013: • 23,183 GWh, 4,885 MW peak • 444 MMtherms	2004–2013
Colorado	Settlement agreement approved by PUC includes specific targets utility will make "best efforts" to achieve.	Public Service of Colorado (the state's largest utility)	320 MW and 800 GWh (40 MW and 100 GWh each year)	2006–2013
Connecticut (Pending final Department of Public Utility Control decisions)	Includes energy efficiency at commercial and financial facilities as one eligible source under its Distributed Resources Portfolio Standard (also includes combined heat and power and load management programs). Goals are given as a percentage of load.	Investor-owned utilities	Savings goals set for the beginning of each program year:	
			1% (TL)	2007
			2% (TL)	2008
			3% (TL)	2009
			4% (TL)	2010 and thereafter
Illinois	Will set goals as percentage of forecast load growth.	Investor-owned utilities	10% (LG)	2006–2008
			15% (LG)	2009–2011
			20% (LG)	2012–2014
			25% (LG)	2015–2017
New Jersey (Program under development)	Two initiatives: 1. Setting energy and demand goals for overall PBF program.	1. PBF program administrators (which is based on competitive solicitation)	1. 1,814 GWH (four-year total)	1. 2005–2008
	2. Setting goals for savings as a percent of sales.	2. Investor-owned utilities	2. Conceptual draft calls *for 1% per year for a total of 12%* in 2016 (TL)	2. 2005–2016 in conceptual draft
			Up to 6.2% (TL)	Years 5–9
			Up to 8.2% (TL)	Years 10–14
			Up to 10.0% (TL)	Years 15 and thereafter
Texas	Sets goals as percentage of forecast load growth.	Investor-owned utilities	10% (LG)	2004 and thereafter
Vermont	Sets energy and demand goals for overall PBF program.	Program administrator	83,766 MWh	2000–2002
			119,490 MWh	2003–2005
			204,000 MWh	2006–2008

The basic EERS concept involves end-user energy-saving improvements that are aided and documented by utilities or other program operators. In some cases distribution system efficiency improvements, combined heat and power (CHP) systems, and other high-efficiency distributed generation systems may be included. EERS are typically implemented at the state level but also have been implemented over smaller areas. With trading, a utility (or other organization responsible for EERS) that saves more than its target can sell savings credits to utilities that fall short of their savings targets. Trading would also theoretically permit the market to find the lowest-cost savings, as with the emissions trading program pioneered in the U.S. EPA acid rain program. Trading also may provide avenues for involvement by third-party providers of energy efficiency savings.

Some advantages of an EERS approach include its clarity, practical simplicity, and ability to monitor performance. In the Texas model, for example, utilities project the amount of savings they will need to achieve, design the necessary programs, and implement those programs (in the Texas case using contractors and energy service companies for delivering the energy efficiency services). Utilities file cases with the public utilities commission identifying the necessary program costs, and those costs are incorporated into the utilities rates. In this manner, customers pay through their rates for the energy efficiency programs, just like they pay for the other resources acquired by the electric system. The utilities also are required to file annual reports that document the program impacts and achievements relative to target savings levels.

A primary motivation for enacting EERS appears to be establishing outcome-based targets for saving energy through increased levels of energy efficiency across customer classes. Historically the amount of energy savings achieved through utility and related energy efficiency and DSM programs have often been examined as an end result, but the primary determinant of the level of energy efficiency program activity has been cost-effectiveness screening process and/or funding levels. Most commonly, budgets are set and then whatever amount of actual savings achieved is simply a program result—not itself a target to be achieved. Such spending-based approaches to energy efficiency are increasingly being judged as inadequate to achieve higher levels of energy savings.

Texas was first to establish an EERS. Its electricity restructuring law created a requirement for electric utilities to offset 10 percent of their demand growth through end-use energy efficiency. Utilities in Texas have had no difficultly meeting their targets and are currently exceeding them on the order of 25 percent (i.e., 12.5 percent of load growth) per year or more. Connecticut and California have both established energy savings targets for utility energy efficiency programs (Connecticut by law and California by regulation), while Vermont has specific savings goals in the performance contract with the nonprofit organization that runs statewide programs under a contract with the Public Service Board. Colorado's largest utility has energy savings goals as part of a settlement agreement, and Illinois, Minnesota, and New Jersey are currently seeking to develop EERS policies to enhance their existing energy efficiency efforts. EERS-like programs have been working well in the United Kingdom and parts of Belgium. Italy has recently started a program, and another is about to start in France.[28]

Some of these state and national policies establish EERS in a "pure" form: they establish legally mandated targets for energy efficiency savings with implementation rules that include implications for non-compliance (in Texas and the European countries, and also under

Author's personal copy

1040-6190/$–see front matter © 2007 Elsevier Inc. All rights reserved., doi:/10.1016/j.tej.2007.03.005

consideration in New Jersey). Other state policies are variations on a pure EERS. These variations include:

- Energy efficiency targets incorporated into contracts for statewide efficiency program providers (in Vermont and New Jersey);
- Energy efficiency targets incorporated into utility commission decisions (in California and Colorado); and
- Non-binding targets established as part of state and/or utility long-term plans, such as has occurred in Illinois and to some extent Colorado.

Because EERS is a relatively recent policy development, experience with these policies is somewhat limited. However, in the cases where EERS have been in place long enough to assess results, it is clear that EERS are having significant impacts. For example, savings in Texas are significantly greater than savings before the EERS began: efficiency savings in 2003 totaled more than half a *billion* kWh, which is two-thirds larger than the 0.3 billion saved in 1998 before the EERS policy began. Large utility energy efficiency budget increases have also been approved in California. For the other states discussed above, data are not yet available as their EERS have all gone into effect after 2003, the last year for which complete state data are available. In all of these states, the EERS is the primary change in policy that could have driven these increased savings and investments.[30]

V. Conclusions

Combining renewable energy and energy efficiency in SEPS has emerged as a key state and national policy option to achieve greater levels of sustainable energy resources with maximum economic efficiency and equity. A key advantage of the SEPS relative to an RPS or EERS is enhanced flexibility and broader options for meeting targets. Another advantage is the financial appeal that energy efficiency can bring; the cost of achieving a saved kilowatt-hour is typically less than the cost of producing a kilowatt-hour through renewable energy. In fact, recognizing the possibility that utilities or other energy suppliers might elect to use energy efficiency to achieve all of a combined portfolio target, Nevada and Pennsylvania have capped the maximum amount of the targets that can be met through energy efficiency. In this way the policies are still seen as fostering the development of renewable energy markets.

Applications of SEPS (and EERS) to date show that they fit within either restructured or non-restructured electricity markets.

- Pennsylvania, Texas, Connecticut, and New Jersey all are restructured states. In these cases, the ability of SEPS and EERS to rely on market-mechanisms appears to be an advantage. Market actors simply have to respond to the established goals and savings requirements.
- Nevada and California are examples of states with "traditional" regulated markets (both states had been restructured, but rescinded those decisions and re-established regulated structures). In these cases, SEPS and EERS are seen as policy instruments to ensure that specific energy targets are established and met via utility programs.

Based on the experience of states to date, a national SEPS holds great promise to achieve significant levels of market penetration among sustainable energy resources. SEPS build on decades of experience with utility and non-utility energy efficiency programs, which have shown the ability of such programs to achieve significant levels of large-scale energy savings at costs significantly less than traditional investments in new generation. Experience at the state level suggests that SEPS goals could be met or exceeded in a very cost-competitive manner by ensuring that cost-effective energy efficiency is pursued as part of the overall resource mix.

Author's personal copy

As with RPS policies, states have led the effort to implement SEPS and EERS policies, and we expect to see more states consider such mechanisms. It is now time to establish a national SEPS, so that all states can benefit from these resources, and the nation can more effectively address its serious energy challenges. In so doing, the marketplace can also operate more efficiently under a common policy foundation, and avoid today's complex mosaic of widely differing state rules and regulations.■

Endnotes:

1. Jerry Taylor and Peter Van Doren, *Energy Myth Five: Price Signals Are Insufficient to Induce Efficient Energy Investments*, in Energy And American Society: Thirteen Myths, Benjamin K. Sovacool and Marilyn A. Brown, Eds. (New York: Springer, 2007), at 125–144.

2. John D. Donahue, The Privatization Decision (New York: Basic Books, 1991). For a discussion of some of the external costs associated with coal power plants along with alternative combustion regimes and carbon sequestration systems, see David G. Hawkins, Daniel A. Lashof and Robert H. Williams, *What to Do about Coal*, Sci. Amer., 68–75, Sept. 2006, and Robert H. Socolow, *Can We Bury Global Warming*? Sci. Amer., July 2005, 293 (1), at 1–8.

3. Barry Bozeman, *Public-Value Failure: When Efficient Markets May Not Do*, Public Administration Rev. 62 (2), 2002, at 134–151; Marilyn Brown, *Obstacles to Energy Efficiency*, Encyclopedia of Energy 4, 2004, at 465–475; Bill Prindle, *Quantifying the Effects of Market Failures in the End-Use of Energy*, Washington, DC: American Council for an Energy-Efficient Economy, 2007.

4. Charles F. Kutscher, *Overview and Summary of the Studies*, in Tackling Climate Change in The U.S., C.F. Kutscher, Ed. (Washington, DC: American Solar Energy Society, 2007), at 7–38.

5. Concentrating solar power (CSP) and wind are based on deployment scenarios; all other renewables indicate resource locations.

6. Kutscher, *supra* note 4, at 36.

7. Kutscher, *supra* note 4, at 22.

8. Kutscher, *supra* note 4, at 25.

9. Included in the biomass resource map are estimates of currently available agricultural residues (crops and animal manure), wood residues, municipal discards (including methane from landfills), and dedicated energy crops.

10. Kutscher, *supra* note 4, at 20.

11. Marilyn A. Brown, Frank Southworth and Therese K. Stovall, *Towards a Climate-Friendly Built Environment*, Pew Center on Global Climate Change, June 2005, available at http://www.pewclimate.org/global-warming-in-depth/all reports/buildings/index.cfm.

12. Marilyn A. Brown, Mark D. Levine, Walter Short and Jonathan G. Koomey, *Scenarios for a Clean Energy Future*, Energy Policy 29 (14), 2001, at 1179–1196.

13. Western Governors' Association, *Clean and Diversified Energy Initiative: Energy Efficiency Task Force Report*, Denver: Western Governors' Association, 2006.

14. Steven Nadel, Anna Shipley and R. Neal Elliott, *The Technical, Economic and Achievable Potential for Energy Efficiency in the U.S.: A Meta-Analysis of Recent Studies*, in Proceedings of 2004 ACEEE Summer Study on Energy Efficiency in Buildings, 2004, at 8.215–8.226.

15. Eric Hirst, *Effects of Utility DSM Programs on Risk*, ORNL/CON-346, Oak Ridge, TN: Oak Ridge National Laboratory, 1992.

16. Edward Vine, Marty Kushler and Dan York, *Energy Myth 10: Energy Efficiency Measures Are Unreliable, Unpredictable and Unenforceable*, in Energy and American Society, *supra* note 1, at 266.

17. *National Action Plan for Energy Efficiency*, Washington, DC: Environmental Protection Agency, 2006, available at www.epa.gov/eeactionplan.

18. U.S. Climate Change Technology Program, *Strategic Plan*, 2006, at http://www.climatetechnology.gov/.

19. Steve Nadel, *Energy Efficiency Resource Standards: Experience and Recommendations*, Washington, DC: American Council for an Energy-Efficient Economy, 2006.

20. *Id.*, at 6, revised from Figure 1.

21. U.S. Environmental Protection Agency, *Clean Energy-Environment Guide to Action: Policies, Best Practices, and Action Steps for States*, 2006, at http://www.epa.gov/cleanenergy/pdf/gta/guide_action_full.pdf; Nadel, *supra* note 19, at 21.

22. Hawaiian Electric Company, Inc., *2005 Renewable Portfolio Standard Status Report*, Honolulu, HI: Hawaiian Electric Company, Inc, 2005, and Kauai Island Utility Cooperative, *Renewable Portfolio Standards (RPS) Status Report*, Honolulu, HI: Oshima Chun Fong & Chung, LLP, 2004.

23. Pennsylvania Public Utility Commission, personal communication with S. Nadel, Jan. 2006.

24. Tom Tuffy (Penn Future), personal communication with S. Nadel, Jan. 2006.

25. Public Utilities Commission of Nevada, *Docket No. 05-7050 Revised Adopted Regulation of the Public Utilities Commission of Nevada*, Feb. 23, 2006, at http://pucweb1.state.nv.us/PUCN/DktInfo.aspx?Util=Rulemaking.

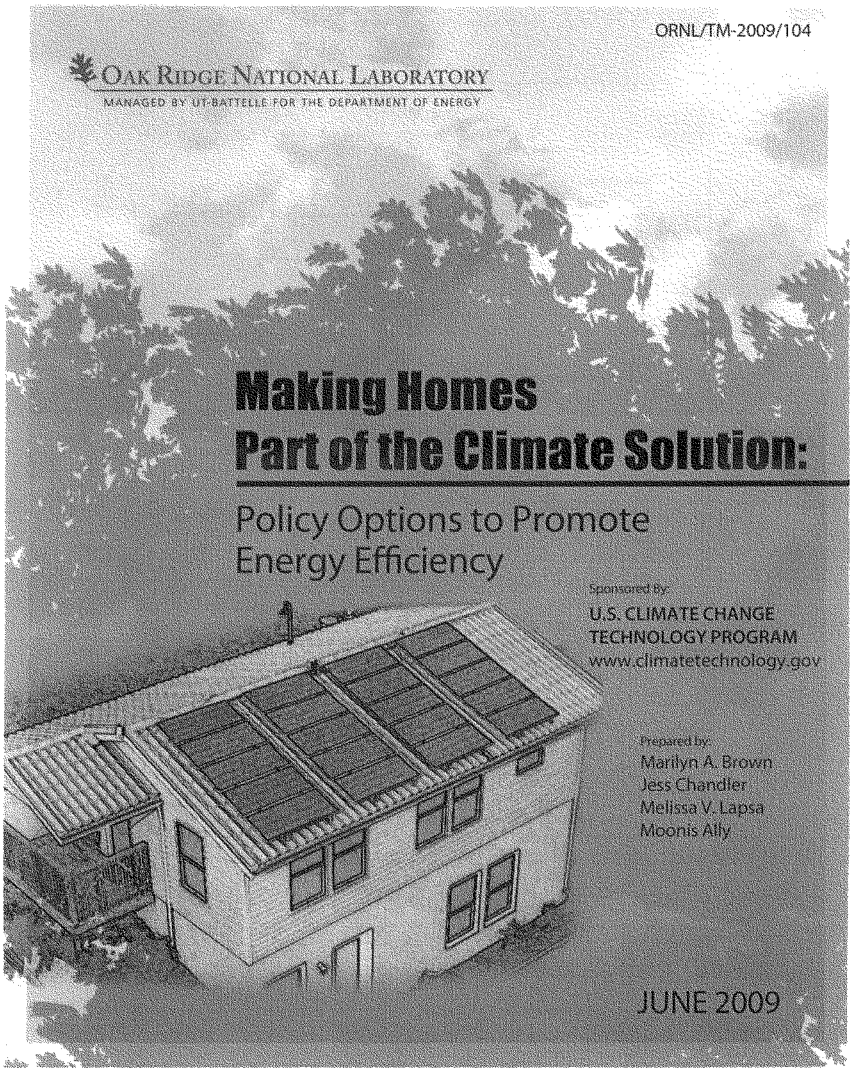
26. Howard Geller, *Utility Energy Efficiency Program Overview*, presentation at 2005 Regional Energy Efficiency Program Workshop, Phoenix, Nov. 3, 2005.

27. Bob Balzar (Nevada Power), personal communication with S. Nadel, Jan. 2006.

28. Nadel, *supra* note 19, at 16–20. EPA, *supra* note 21, at 4-10 to 4-13.

29. EPA, *supra* note 21, at 4-10 to 4-13, and Nadel, *supra* note 19, at 16–20.

30. Nadel, *supra* note 19, at 22.



ORNL/TM-2009/104

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Making Homes Part of the Climate Solution:

Policy Options to Promote Energy Efficiency

Sponsored By:
U.S. CLIMATE CHANGE
TECHNOLOGY PROGRAM
www.climatetechnology.gov

Prepared by:
Marilyn A. Brown
Jess Chandler
Melissa V. Lapsa
Moonis Ally

JUNE 2009

DOCUMENT AVAILABILITY

Reports produced after January 1, 1996, are generally available free via the U.S. Department of Energy (DOE) Information Bridge.

Web site http://www.osti.gov/bridge

Reports produced before January 1, 1996, may be purchased by members of the public from the following source.

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Telephone 703-605-6000 (1-800-553-6847)
TDD 703-487-4639
Fax 703-605-6900
E-mail info@ntis.gov
Web site http://www.ntis.gov/support/ordernowabout.htm

Reports are available to DOE employees, DOE contractors, Energy Technology Data Exchange (ETDE) representatives, and International Nuclear Information System (INIS) representatives from the following source.

Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
Telephone 865-576-8401
Fax 865-576-5728
E-mail reports@osti.gov
Web site http://www.osti.gov/contact.html

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

ORNL/TM-2009/104

Energy and Transportation Science Division

Making Homes Part of the Climate Solution: Policy Options to Promote Energy Efficiency

Marilyn A. Brown,* Georgia Institute of Technology
Jess Chandler, Georgia Institute of Technology
Melissa V. Lapsa, Oak Ridge National Laboratory
Moonis Ally, Oak Ridge National Laboratory

June 2009

Prepared by
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6283
managed by
UT-BATTELLE, LLC
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-00OR22725

*Corresponding author:
Dr. Marilyn A. Brown
Professor, School of Public Policy
Georgia Institute of Technology
DM Smith Building
685 Cherry Street, Room 312
Atlanta, GA 30332-0345
email: marilyn.brown@pubpolicy.gatech.edu
Phone: 404-385-0303

Table of Contents

Table of Contents v
List of Tables vi
List of Figures vi
Acknowledgments vii

1 Introduction 1
1.1 Context 1
1.2 Research Approach 4

2 Policy Options to Promote Energy Efficient Residential Construction 9
2.1 Advancing and Enforcing State Building Energy Codes 10
2.2 Expanded Use of Home Energy Performance Ratings 21

3 Policy Options to Promote Energy-Efficient Improvements to Existing Residences 31
3.1 Mandated Disclosure of Energy Performance Information 32
3.2 On-Bill Financing of Energy-Efficiency Improvements 49

4 Utility-Based Policy Options to Promote Energy-Efficient Residential Buildings 63
4.1 Performance Specifications for Smart Meters and Expanded Demand Response 64
4.2 Alignment of Utility Financial Incentives with Customer Energy Efficiency 76
4.3 National Energy Efficiency Resource Standard (EERS) 82

5 Conclusions 97

6 References 105

List of Figures

1.1 Projected Change in Carbon Dioxide Emissions by Sector, 2009-2030 2
1.2 Federal Policies to Reduce GHGs in Buildings, by Type of Policy and Measure 3
2.1 Status of Residential and Commercial State Energy Codes as of February 2009 12
2.2 Costs and Savings in New Residential and Commercial Construction, 2010-2030 18
3.1 Energy Rating Form in use in Denmark 36
3.2 Progress Energy Example Energy Analysis Graph: "Most Recent 12 Months Compared to Previous 12 Months 46
3.3 Conceptual Organization of an "On-Bill Financing" Program 50
3.4 Fannie Mae Energy Loan Process 52
4.1 Summary of Pricing Pilot Savings 67
4.2 Supply and Demand Curves in (A) Normal Markets vs. (B) Capacity-Constrained Markets with Perfectly Inelastic Demand 70
4.3 Example of Flow Chart of How to Measure Societal Benefits 72
4.4 Comparison of Estimated Range of Benefits and Costs of Advanced Metering Systems 75
4.5 Status of Decoupling Requirements Across States in 2008 81
4.6 Energy Efficiency Resource Standards in the States 83
5.1 Timeline of Anticipated Energy Savings from Alternative Policy Targets 97

List Tables

1.1 Markets Addressed by the Seven Policy Options 6
2.1 Incremental Cost Estimates for Residential Energy Code Compliance 19
2.2 Existing Occupied Housing Units by Census Region, 2005-2007 26
2.3 What does the HERS Number Mean? 27
2.4 Energy Savings required to Recover the Cost of Rating 29
3.1 Existing Occupied Housing Units and Home Sales by Census Region, 2005-2007 41
3.2 Vintage of Occupied Housing Units in the United States, 2007 43
3.3 Estimated Utility Bill Savings after Switching to ENERGY STAR or Best Available Technology 44
4.1 Estimates of U.S. Efficiency Potential as a Percent of End-Year Forecast Consumption 93
5.1 Summary Assessment of Policy Options 98
5.2 Complementariness of the Seven Policy Options 102

ACKNOWLEDGMENTS

This report was sponsored by the U.S. Climate Change Technology Program (CCTP). We wish to acknowledge Dr. Robert Marlay, Director of the U.S. Department of Energy's Office of Science and Technology Policy and Deputy Director of CCTP, who saw the value in funding this study and who contributed to its design and execution. Similarly, we thank Lindsay Roland who was an important contributor to the report's scope and content, and helped navigate through multiple revisions.

Several colleagues took the time to review this study, and their insights and feedback are greatly appreciated:

- Jean Boulin (DOE Building Technology Program)
- Jerry Dion (DOE Building Technology Program)
- Patrick Hughes (Oak Ridge National Laboratory)
- Larry Mansuetti (DOE Office of Electricity)
- Andrew Nicholls (Pacific Northwest National Laboratory)
- Paul Stern (National Academies)
- Ed Vine (California Institute for Energy and Environment)

This report would not have been possible without the involvement of the behavioral workshop participants who provided valuable background on non-technical explanations for the existence of an energy efficiency gap. In addition to most of the experts listed above, the workshop participants included the following individuals:

- Karen Ehrhardt-Martinez (American Council for an Energy-Efficient Economy)
- Mark Freidrichs (DOE Climate Change Technology Program)
- Jeff Harris (Alliance to Save Energy)
- Kathryn Janda (Oxford University)
- Skip Laitner (American Council for an Energy-Efficient Economy)
- Loren Lutzenhiser (Portland State University)
- Sean McDonald (Pacific Northwest National Laboratory)
- Christopher Payne (Lawrence Berkeley National Laboratory)
- Graham Pugh (DOE Climate Change Technology Program)
- Linda Schuck (California Institute for Energy and Environment)

In addition, Joan Pellegrino and Matt Antes from Energetics Incorporated helped to facilitate the workshop and to summarize its findings. Elise Logan (Federal Energy Regulatory Commission) and Nilgun Atamturk (California Public Utilities Commission) also merit acknowledgment. They were both graduate research assistants at the Georgia Institute of Technology in 2008, and they both contributed significantly to this project.

Finally, we wish to thank Charlotte Franchuk for assistance with the report's references and formatting. Her attention to the details of manuscript production was invaluable.

1 INTRODUCTION

In the area of energy efficiency, advanced technologies combined with best practices appear to afford not only large, but also cost-effective options to conserve energy and reduce greenhouse gas emissions (McKinsey & Company, 2007). In practice, however, the realization of this potential has often proven difficult. Progress appears to require large numbers of individuals to act knowledgeably, and each individual must often act with enabling assistance from others. Even when consumer education is effective and social norms are supportive, the actions of individuals and businesses can be impeded by a broad range of barriers, many of which are non-technical in nature.

Title XVI of the Energy Policy Act of 2005 included a mandate to examine barriers to progress and make recommendations in this regard. A detailed report on barriers as well as the National strategy for overcoming barriers met this requirement (Brown et al, 2008; CCCSTI, 2009). Following up on this mandate, the U.S. Climate Change Technology Program (CCTP) chose to focus next on the development of policy options to improve energy efficiency in residential buildings, with supporting analysis of pros and cons, informed in part by behavioral research. While this work is sponsored by CCTP, it has been undertaken in coordination with DOE's Building Technologies Program and Office of Electricity Delivery and Energy Reliability.

1.1 Context

Residential buildings account for about 21 percent of U.S. energy use and energy-related CO_2 emissions (EIA, 2009, Tables A2 and A18). Over the long term, buildings are expected to continue to be a significant component of increasing energy demand and, both directly and indirectly, a major source of CO_2 emissions (Figure 1.1). This is driven in large part by the continuing trends of population increase, economic recovery and growth, urbanization, and rising standards of living. In the U.S. the need for energy efficiency is made both more urgent and intractable by the longevity of building stocks.

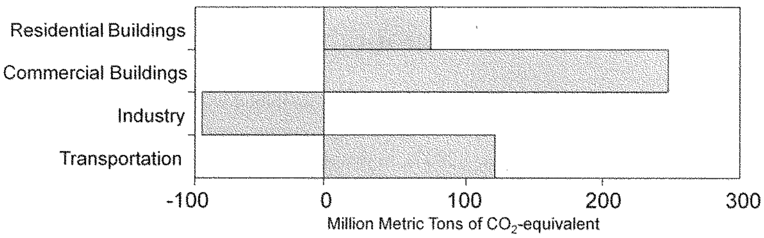


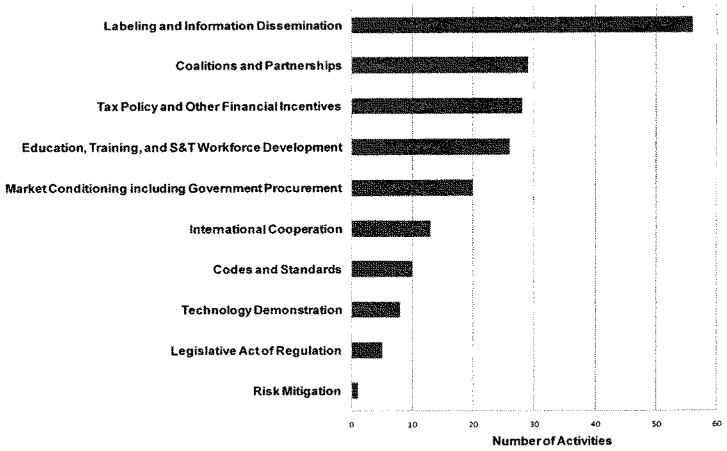
Figure 1.1 Projected Change in Carbon Dioxide Emissions by Sector, 2009-2030
(Source: EIA, 2009)

As the U.S. population grows, a substantial amount of new housing will be added – perhaps as many as 20 to 30 million new units are expected to be built between 2005 and 2030. In addition, much building equipment and many structural features of the existing housing stock will be upgraded over the next several decades. It would seem wise to design, build, and refurbish this infrastructure with exemplary energy performance and supporting behavioral accommodations, lest opportunities for efficiency improvements are lost (Dirks et al., 2008).

A total of 124 Federal policies, programs, and measures are currently in place to encourage more efficient use of energy in buildings.[1] Most prominent among these Federal deployment activities are a range of labeling and information dissemination programs. There are also 20 or more Federal activities targeting GHG reductions in buildings that involve coalitions and partnerships; tax policy and other financial incentives; education, training, and workforce development; and market conditioning. Relevant Federal policies also include power rates offered by the Bonneville Power Administration, Tennessee Valley Authority and other federal power producers that typically do not pass along real-time power prices to residential consumers. In addition the federal government influences mortgage interest tax deductions that encourage increased home sizes, and highway construction programs that promote sprawl at the expense of mixed-use transit oriented development. State and local policies also have wide-ranging influences on residential markets, sometimes promoting climate-smart development patterns and building practices, but often favoring low-density, energy-intensive land use development.

---

[1] Source: CCTP/Energetics Deployment Inventory Database dated June 5, 2009. For a description of these deployment activities, see CCCSTI (2009).



Source: CCTP/Energetics Deployment Inventory Database dated June 5, 2009.
Note: Some activities fit into more than one category, so the total count exceeds the total number of

Figure 1.2 Federal Policies to Reduce GHGs in Buildings, by Type of Policy and Measure

These activities can facilitate significant potential savings when the products of Federal research and development efforts are picked up in the marketplace. For example, an analysis of the 2005 DOE Building Technologies program budget estimated savings in the residential sector of 560 TBtu by 2030 (Scott et al, 2008).[2] However, there are still many opportunities for improving efficiency that are not being explored. One recent National estimate of energy savings in residential buildings found the techno-economic potential to be 30 percent for electricity and 28 percent for natural gas over "business-as-usual" in 2030 (Brown, R. et al., 2008). New policies may be needed to address effectively non-technical and behavioral barriers that continue to thwart the more rapid diffusion and greater adoption of cost-competitive, low-carbon buildings technologies in the residential sector.

Consumers have been found to be largely unaware of the relationships between their lifestyles, energy consumption, and the environment (Garrett and Koontz, 2008). Behavioral-related studies have shown that individuals do not know how much energy appliances or their homes use, do not know where energy comes from, assume new appliances are efficient, do not consider energy when they make purchasing decisions, and focus on up-front costs (Lutzenhiser, 2009; DEFRA, 2007; McKeown, 2007).

---

[2] This estimate is based on two DOE residential programs: Building America and Building Energy Codes

Research on residential energy consumption suggests the following general lessons according to Stern (2008a, b):

- "The influences on behavior are quite varied and do not fall in the domain of any one discipline (economics, psychology, etc.)
- The pattern of influences on behavior can vary greatly with the behavior
- The strongest influences on behavior are often contextual (building structure, available technology, home ownership, legal and regulatory requirements, material costs and rewards, convenience, etc.)
- The more a behavior is shaped by context, the weaker the effect of personal factors
- Behaviors are often not chosen; many are habitual
- When choices are made, they are not often carefully considered
- The most productive approach to understanding these behaviors is multidisciplinary"

The purposes of this effort are to (1) revisit the overall situation in light of a growing body of recent social and behavioral research and to (2) examine a series of proposed remedies in the form of policy options and supporting analysis. This work is motivated, in part, by an increased sense of urgency regarding the need to improve energy efficiency, lower consumer energy expenditures, moderate pressures for new energy supply, and reduce greenhouse gas emissions and their associated environmental effects.

1.2 Research Approach

This research project began with a literature review and assessment of barriers to the deployment of greenhouse gas mitigation technologies (Brown et al., 2008). The review built on a foundation of similar efforts, including the Office of Technology Assessment's 1992 report on Buildings Energy Efficiency; DOE Office of Policy's 1996 report, "Policies and Measures for Reducing Related GHG Emissions: Lessons from Recent Literature," and the ACEEE Buildings Summer Study Proceedings from 2008. A review article on behavioral issues in energy-efficient buildings was also commissioned from Paul Stern of the National Academies (Stern, 2008a).

This literature review, in turn, helped inform the design of a "Buildings Workshop on Behavioral Research and Energy Use" that was held in February 2008 in Washington, DC. The purpose of the workshop was to obtain a broad understanding of socio-economic aspects of energy consumption in buildings as a basis for more informed greenhouse gas mitigation policy recommendations by CCTP. After various presentations and brainstorming sessions, the workshop's 15 expert participants were asked to identify potentially effective policies for further consideration. Follow-on discussions with several workshop participants and others helped identify a dozen policy options for further consideration. The selection and design of these policy options was informed by past research on the human dimension of energy use – a domain ignored by most policies that seek only to incrementally change particular end-uses in the techno-economic arena (Parnell and Larson, 2005; Kempton and Niemann, 1987).

In order to evaluate and narrow the set of the candidate policy options, the following seven criteria were applied.

1) **Appropriateness of the Federal role**. Many of the more effective policy options and measures in this area require State or local action, as the jurisdictional responsibilities reside most strongly at this level of governance. However, State and local action may be encouraged by supportive Federal policy options and measures. Clarity must be provided with respect to specificity and appropriateness of the Federal role.
2) **Broad Applicability**. Since the number of proposed policy options and measures to be analyzed is small, but their impact is derived to be large, the options selected for analysis should have broad applicability across the National scene, encouraging action at a fairly comprehensive scale.
3) **Significant Potential Benefits.** Policy options and measures with significant and early quantitative benefits are to be favored over those with later and fewer benefits.
4) **Solutions not Dependent on Future R&D**. The policy options and measures selected should address barriers and/or risks of mainly an institutional, policy, or non-technical nature. The answers to some non-technical barriers, such as lack of enablers, may reside in the technological arena, but the barrier itself should not be seen primarily as a technology R&D limitation.
5) **Cost Effectiveness.** In the analysis, both costs and benefits must be weighed. In the selection of policy options to study, consideration should be limited to those that would be expected to have reasonable costs, a strong social benefit, and a relatively high benefit-to-cost ratio.
6) **Administrative Practicability**. For policy options to be implemented, they need to be capable of being fairly easily established and, if necessary, managed and/or enforced. Some may require special training or expertise, broadly applied across the nation. Some approaches can be focused on a limited set of players in the delivery system. Such implementation factors are considered here.
7) **Additionality**. The collection of selected policy options should be diverse, such that each option represents a somewhat different approach to a barrier or to different market segments. Thus, each policy option is evaluated in terms of the independent contribution it could make above and beyond the influences of existing policies.

Brief assessments of the 12 policy options were prepared covering these seven criteria. A short list of seven policies resulted, which are described in this report (Table 1.1). As the following table shows, these policies address various parts of the residential building market, especially existing homes. In addition, several of these policies could be helpful in promoting energy efficiency economy-wide. A national energy efficiency resource standard, in particular, could have far-ranging impacts in commercial and industrial markets as well as in the housing market.

Table 1.1 Markets Addressed by the Seven Policy Options

	New Residential Construction	**Existing Homes**	**Gas & Electric Utilities**	**Commercial Buildings**	**Industrial Facilities**
Policy Options to Promote Energy Efficient Residential Construction					
Advancing and Enforcing State Building Energy Codes	●			●	
Expanded Use of Home Energy Performance Ratings	○	●	○		
Policy Options to Promote Energy-Efficient Improvements to Existing Residences					
Mandated Disclosure of Energy Performance Information	○	●		○	
On-Bill Financing of Energy-Efficiency Improvements		●			
Utility-Based Policy Options to Promote Energy-Efficient Residential Buildings					
Performance Specifications for Smart Meters and Expanded Demand Response	○	○	●	●	○
Alignment of Utility Incentives with Customer Energy Efficiency	○	●	●	●	○
National Energy Efficiency Resource Standard (EERS)	●	●	●	●	●

● = Primary market; ○ = Secondary market

No policy option is free of issues or sensitivities. There are typically pros and cons; benefits and costs. There will be segments of society and the economy that may gain, others may not, and dislocations may occur. In the process of debating the merits of policy options, these cross currents of concern will manifest themselves in vigorous policy debates from all sides. In considering policy options, a priori, these issues and sensitivities should be made clear to those considering them, before they go forward into full-scale public view, whether in the form a rule-making, proposed legislation, or even as administrative actions. The format of this policy options report is intended to allow these issues to be made visible, illustrated by analysis, and clearly understood.

The savings from a combination of these policies will be complementary (slightly overlapping in cases), but necessarily so as sets of policies work together to enable and then transform the market by reaching many actors and helping overcome their barriers. Four conditions are assumed to be necessary to enable a particular energy saving option (such as installing additional insulation or purchasing more efficient windows): the option must be available; adopters must have sufficient knowledge about the option (unless the option is required by law); restrictions or barriers to adoption must be removed; and adopters must be motivated to invest in the option (Boonekamp, 2006). A combination of policy instruments – including information, economic measures, and enabling administrative and technology changes would be useful to foster energy efficient behavior (Linden, Carlsson-Kanyama, and Eriksson, 2006). To make sufficient headway, individual householder self-interest, energy knowledge, and cognitive capacity should be considered in the design of energy conservation policies (Parnell and Larsen, 2005).

Establishing a *National Energy Efficiency Resource Standard (EERS)* will have an economy-wide impact, and a percentage of savings will be applied to the residential sector. In the presence of an EERS, other policies to reduce consumption in the residential buildings sector would likely add up to meet and/or exceed the target. *Home energy performance ratings, mandatory disclosure of home energy performance, and smart meters* can reduce information barriers and help consumers make a more conscious approach to energy consumption; these policies can increase consumer knowledge about energy without over-taxing their cognitive skills. However, changes will be limited by financial and market barriers – consumers face relatively low aggregate energy prices, and both consumers and providers face risky returns for investing in more efficient technology if it is not the norm. Policies to improve *building code* compliance can ease market barriers and establish a ceiling for future home energy performance. *Dynamic pricing structures* can provide incentives to consumers to make it in their self-interest to change their consumption behavior while *on-bill financing* can relieve stress on consumers from high first costs, high discount rates, and lack of access to capital. Policies to *remove utility disincentives to investing in customer energy efficiency* can encourage greater utility involvement in a transition to a more efficient energy economy.

Further understanding of interactions can be achieved through ongoing monitoring and evaluation of policies in the field. Because products, practices and prices all change over time, the policies in place to move the market will have to be resilient and adaptive.

2 Policies to Promote Energy Efficient Residential Construction

During the design and construction of homes and apartment complexes, opportunities for energy efficiency exist that become prohibitively expensive and technically infeasible once the structure is complete (Dirks et al., 2008). This suggests that a premium should be placed on energy-efficient residential construction. In reality, newly constructed homes often do not benefit from "best practices," as represented by the technologies and design features embodied in the code recommendations of the International Energy Conservation Code (Lowe and Oreszczyn, 2008). These "lost opportunities" result from a range of complex barriers including industry fragmentation, misplaced incentives, incomplete and asymmetric information, and lack of a knowledgeable workforce (Brown et al., 2008).

The construction industry is *large, diverse, and fragmented* with numerous players whose interests often do not align. Nearly 500,000 homebuilders operate each year; the five largest of these account for less than seven percent of new homes, while the top 100 account for just another seven percent (DOE/EERE, 2003). Besides builders, decision-makers influencing the construction industry also include investors, owners, occupants, tradesmen, architects, equipment manufacturers, suppliers, lenders, insurers, codes and standards setters, zoning officials, realtors, and so forth. This means that a large number of firms and individuals need to be influenced to have a significant collective impact because those engaged in building design and construction generally have little interaction with each other. The result is lack of information awareness among builders, consumers, and specialists in the building process (Alliance to Save Energy, 2005; Loper et al., 2005).

The numerous participants in the decision-making process have distinct interests, they impact the process at different points in design, construction and use, and they often act as decision-making intermediaries who do not represent the long-term interests of building owners and occupants (CCCSTI, 2009; Brown et al., 2009). In the case of new buildings, developers and speculative builders emphasize the need to limit construction costs and disregard the need to constrain operating costs, since their financial interests end with the sale of the building. This is a classic example of *misplaced incentives,* or the principal-agent problem. These decision criteria hinder investments in energy-efficient designs and technologies that require a greater up-front investment to achieve lower life-cycle operating costs. Energy-efficient building technologies are most affordable when installed during the construction phase; achieving post-construction energy savings can be comparatively expensive and technically challenging.

Many green building technologies are cost effective on a life cycle basis but are often not adopted because builders and consumers do not know if higher up front expenditures in improved building design will translate to increased value or equity in the property later. The public is generally accepting/supportive of improved home energy efficiency, but their understanding of policies and technologies is limited (Raven et al., in press). Thus, speculative builders invest in houses with the hope of attracting homebuyers; higher up-front costs associated with "green" features may not be valued by home buyers due to complexities associated with decisions such as home purchases and the inability to "warrant" efficiency levels. Builders who adopt more efficient technologies face greater market risks because their costs are higher and they do not know whether the market will clear these higher costs. Greater understanding of non-energy benefits and market dynamics could drive adoptions of more efficient building practices (Jakob, 2006). Similarly, widespread compliance can simultaneously reduce market risks and incremental costs.

In the buildings industry, there is also a *workforce training gap*. Few builders or tradespeople have access to sufficient training in new technologies, new standards, new regulations, and best practices. Lowe and Oreszczyn (2008) describe this lack of knowledge as a remnant of the shift of the construction industry from one of apprenticeship to one of labor, and they offer that the industry will need to become a producer of human capital in order to support a new generation of residential buildings. Local government authorities tend to face this difficulty as well with building code officials working without skills necessary to evaluate compliance with building energy codes.

The result of these market barriers and obstacles is a large reservoir of lost opportunities for improving the energy efficiency of U.S. housing. The following policy options would help address barriers to energy efficiency in residential construction practices.

2.1 Advancing and Enforcing State Building Energy Codes

Policy Option: Expand technical assistance to States to accelerate their adoption of advanced building energy codes. Subject to available funds, provide financial assistance to establish and expand training and certification programs focused on third-party verification of building energy code compliance.

2.1.1 Synopsis of Policy Option

A vigorous Federal effort is required to accelerate the promulgation of flexible and advanced State building energy codes and to ensure that compliance is thorough. A two-pronged Federal approach is proposed here.

Expand technical assistance to States to accelerate their adoption of advanced building energy codes. Providing technical assistance to ensure that advanced energy codes are adopted across the country brings the industry of professionals who are designing, supervising, and constructing buildings into a consistent framework that recognizes the need for region- and climate-specific energy solutions while at the same time ensuring economics of regulation. Uniform adoption and enforcement of codes also reduces market risks, ensuring that no one builder takes on all the first-of-a-kind costs while others reap the benefits; over time, improved building construction practices can reduce technical risks as builders and users "learn-by-doing." DOE could support accelerated building code adoption by States by expanding the technical assistance activities of its Building Codes Assistance Program.

Provide technical and financial assistance (subject to available funds) to establish and expand training and certification programs focused on third-party verification of building energy code compliance. Strong compliance efforts can reduce the ability of building owners to avoid meeting strict building energy code guidelines in order to keep their costs down; this is especially a concern when the initial owner or builder will not bear the future energy costs over the years the building remains in use. Third-party verification (also called assessment or inspection) is required for the National Green Building Standard, recently developed under the ANSI process and approved by ANSI.[3] Federal technical and financial assistance could support development of a third-party verification industry as well as liaisons to work with the third-party verifiers, the construction industry, and local officials charged with building permitting. Compliance training will be an essential part of this policy, at least in its infancy. The effectiveness of this training could be greatly enhanced by the provision of (1) technical assistance to train the trainers and develop common training modules, and (2) financial assistance to offset some of the costs of providing and taking the training.

Recognizing the need to upgrade and enforce building energy codes, the American Recovery and Reinvestment Act (ARRA) requires governors who want a share of State energy assistance grants to certify their State will adopt an energy code for one- and two-family homes, townhouses and low-rise, multiple-family buildings that meets or exceeds provisions in the 2009 IECC for residential construction, and the ANSI/ASHRAE/IESNA Standard 90.1-2007, as referenced in the 2009 IECC for commercial buildings. DOE is currently in the process of determining whether or not adoption of the 2009 IECC for commercial buildings is sufficient to meet this requirement, as there are differences between the 2009 IECC and Standard 90.1-2007 for commercial buildings. The ARRA also requires governors to certify that they will put in place a plan to achieve compliance with their certified energy codes within eight years in at least 90 percent of new and renovated residential and commercial building space. The required plan is also to include training and enforcement programs.[4]

---

[3] http://www.energycodes.gov/news/items/022409_ansi.stm

[4] http://www.energycodes.gov/news/items/022409_stimulus.stm

2.1.2 Policy Experience

Despite the continuous upgrading of residential and commercial energy building codes in many States across the nation, there is considerable room for improvement. As of February 2009, only 22 States have residential codes that meet or exceed the 2006 International Energy Conservation Code (IECC). In fact, 15 States either have no residential energy codes or their codes precede the 1998 IECC.[5] Similarly, only 25 States have commercial codes that meet or exceed the ASHRAE 90.1-2004 code, and 14 States either have no commercial energy codes or their codes precede ASHRAE 90.1-1999.[6] As Figure 2.1 shows, most of the States along the eastern and western seaboard have modern codes, while there is a cluster of Mountain, Upper Midwestern, and Southeastern States with outdated codes.

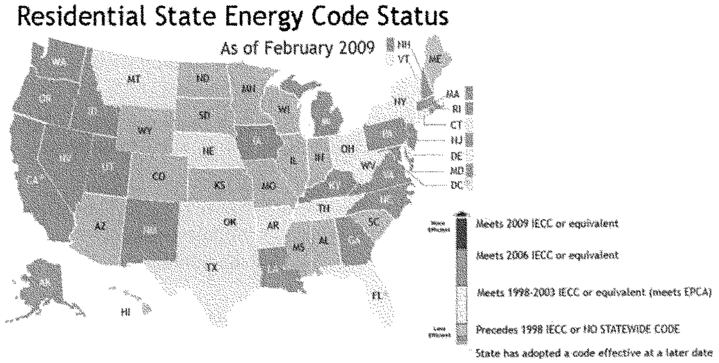

Residential State Energy Code Status
As of February 2009
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
VA
NC
SC
GA
FL
PA
NY
VT
NH
ME
MA
RI
CT
NJ
DE
MD
DC
AK
HI
More Efficient
Meets 2009 IECC or equivalent
Meets 2006 IECC or equivalent
Meets 1998-2003 IECC or equivalent (meets EPCA)
Less Efficient
Precedes 1998 IECC or NO STATEWIDE CODE
State has adopted a code effective at a later date

Figure 2.1 Status of Residential State Energy Codes as of February 2009
(Source: DOE EERE Building Energy codes Program:
http://www.energycodes.gov/implement/state_codes/index.stm)

One of the reasons that States have not adopted the most current energy code might be that DOE may not be completing its determination fast enough to push states to adopt new codes.[7]

---

[5] The energy Code that applies to most residential building is the IECC, which supersedes the Model Energy Code. The 2000 IECC is the most recent version for which DOE has issued a positive determination. The Federal Energy Conservation and Production ACT (ECPA) was amended in 1992 to require states to review and adopt the MEC (and its successor, the IECC), or submit to the Secretary of Energy its reasons for not doing so.

[6] Most commercial building energy codes are based on ASHRAE/IESNA Standard 90.1, jointly developed by ASHRAE and the Illuminating Engineering Society (IES). ECPA requires states to adopt the most recent version of ASHRAE Standard 90.1 for which DOE has made a positive determination for energy savings, currently 90.1-1999. By referencing Standard 90.1 for commercial buildings, IECC offers designers alternate compliance paths.

[7] The Energy Policy and Conservation Act (EPCA, Public Law 94-163), as amended by the Energy Policy Act of 1992 (EPACT, Public Law 102-486), establishes a role for DOE to determine whether revisions to energy conservation codes would lead to energy savings; if DOE makes a positive determination, states must consider adopting the code in their state and provide a

Nevertheless, many States are surpassing these older codes, but their code compliance is often limited. The continuous updating of existing codes, adoption of new codes, and expansion of code programs to improve compliance and achieve real energy and financial savings appear to be difficult for many States because they lack consistent code enforcement and support programs.

Several State, Federal initiatives, and regional non-governmental organizations (NGOs) focus on modernizing State building code practices.

- The Building Codes Assistance Program (BCAP) established in 1994, is a joint initiative of the Alliance to Save Energy, the American Council for an Energy-Efficient Economy (ACEEE), and the Natural Resources Defense Council and partly funded by DOE. BCAP provides custom-tailored assistance on building energy code adoption and implementation to assist State and local regulatory and legislative bodies and help coordinate others representing environmental interests, consumers, labor, and industry. BCAP provides States with code advocacy assistance, and coordinates with DOE to provide technical assistance.
- DOE has provided financial assistance to selected States to support their implementation of model building codes. For example, in September 2008, DOE announced awards for six State-led projects (Florida, Georgia, Massachusetts, Nebraska, North Carolina, and Washington) valued at $2.6 million (DOE Share) to develop advanced building codes. Grants will assist States in developing and implementing plans that will achieve model building codes representing a 30 percent improvement over ASHRAE 90.1-2004 and/or the 2006 IECC. The DOE investment in advanced codes will leverage a project cost share of $2.3 million.[8]
- DOE's Building Energy Codes Program provides compliance tools for residential (REScheck) and commercial (COMcheck) buildings. DOE's website provides many ways to verify that construction meets the requirements of codes, including the REScheck and COMcheck programs that are both downloadable and web-based.
- The Whole Building Design Guide (WBDG) has introduced an Applied Research section to serve as a clearinghouse of government sponsored research findings to improve performance of federal facilities by sharing expert resources, knowledge, practices and strategies. The goal of WBDG is to create a successful high-performance building by applying the integrated design approach and the integrated team approach to the project during the planning and programming phases (http://www.wbdg.org/).
- Recognizing that building energy codes set a floor on the energy efficiency of buildings, the Southwest Energy Efficiency Project (SWEEP) has developed the Going Beyond code guide to assist State and local governments achieve even higher standards of energy efficiency. Beyond code efficiency can be seen mostly in Western States where the percentage of new construction meeting ENERGY STAR® guidelines is higher than the

---

response. The last positive determination for residential building energy codes was in 2001 for the 1998 and 2000 versions of the International Energy Conservation Code; for commercial buildings it was in 2002 for the ASHRAE Standard 90.1-1999.(source: http://www.energycodes.gov/implement/determination_process.stm)

[8] BCAP Newsletter, October 2008 edition. http://www.bcapenergy.org/files/BCAP_Newsletter_October_2008_Edition.pdf

rest of the country; Nevada had a 71 percent ENERGY STAR residential penetration rate in 2006, leading the nation (ENERGY STAR, 2008).

- Regional NGOs such as Northeast Energy Efficiency Partnership (NEEP), Northwest Energy Efficiency Alliance (NEEA), Midwest Energy Efficiency Alliance (MEEA), and more recently Southeast Energy Efficiency Alliance (SEEA) have strong initiatives in the codes area.

Building standards can be distortionary, in spite of their numerous positive influences. Because codes and standards take a long time to adopt and modify, the best performing materials and technologies are not readily deployed, thereby inhibiting innovation and encouraging obsolete technology. Consider the REScheck tool for assisting building code implementation. This tool incorporates tradeoffs between technologies to meet the code requirements of the state or local code, in the jurisdiction permitting its use; in some cases, these tradeoffs lead to distortions when credits are allowed for practices which have become common from the trade-off incentives offered, inhibiting further improvements in efficiency. For example, in the Upper Midwest there is upwards of 80 percent penetration of condensing gas furnaces. The tradeoffs to meet the code allow savings from this now common high efficiency furnace to be used to offset poor envelopes. As a result, this code specification is no longer promoting improved building practices because it has not adapted to technology advances (Brown and Chandler, 2008). Codes that are outdated or fail to adapt to changing available technologies can represent lost opportunities to improve energy efficiency.

Perhaps a more current example of a technology barrier is the long retention of the center of glass U-factor criteria rather than the whole window U-factor criteria. The lack of building infiltration criteria, solar heat gain coefficient (SHGC) criteria, and duct testing requirements are also barriers to technological innovation and progress in new construction (Boulin, 2009).

Smith and McCullough (2001) document various State efforts to meet compliance and enforcement needs with a limited staff and complex performance based codes, suggesting the need for third-party verification. A survey in 2007 found an estimated compliance rate of 80 percent for commercial energy codes among those respondents who provided an estimate – most either did not know or were unwilling to respond (Zing Communications, 2007). However, the same survey showed widespread lack of inspection and verification; "[a]s a weighted average of all respondents, about one in 10 reports that compliance inspections do not occur in their jurisdictions" (Zing Communications, 2007, p.23). The degree of compliance with residential building energy codes is generally unknown, and is likely to remain so, without a verification system. Evidence provided by Yang (2005) suggests a considerable code enforcement and compliance shortfall. The study, which reviewed the existing energy code evaluation studies of 16 States, showed that in general, the Pacific/Western States exhibited higher code compliance rates than the rest of the country. Some of the study's additional findings were that improvements in energy efficiency were offset by increases in the size of homes, HVAC equipment was excessively oversized, compact fluorescent lamp (CFL) penetration was low, and there was a need for better builder and consumer education.

2.1.3 Policy Rationale

One of the most important barriers to the deployment of energy-efficient building designs and technologies is institutional: the decision-making process is complex and fragmented by numerous players, including investors, owners, occupants, builders, tradesmen, architects, equipment manufacturers, suppliers, lenders, insurers, codes and standards setters, realtors, and so forth. Each of these participants in the decision-making process has distinct interests and impacts the process at different points in design, construction and use (CCCSTI, 2009; Brown et al., 2009).

As a result of this fragmentation, the buildings industry is replete with decision-making intermediaries that do not represent the long-term interests of building owners and occupants. In the case of new buildings, developers and speculative builders emphasize the need to limit construction costs and disregard the need to constrain operating costs, since their financial interests end with the sale of the building. Federal action that accelerates State adoption of advanced building energy codes and promotes greater code compliance through third-party verification would directly address this barrier and could reduce lost opportunities for energy efficiency.

2.1.4 Stakeholders and Constituencies

Modern and better enforced residential building energy codes would protect the interests of consumers and would reduce the consumption of fossil energy, thereby mitigating greenhouse gas emissions and the release of other pollutants. States with out-dated building practices will be challenged to learn and implement more advanced building practices, which may be an unpopular requirement among some builders, architects, equipment manufacturers, suppliers, and perhaps code officials, who will have to deviate from "business-as-usual." However, with technical and financial assistance from the Federal government, this transition should be feasible.

2.1.5 Policy Evaluation

Appropriateness of the Federal Role. The Federal government uses the BCAP network to train code officials, liaisons, construction professionals, and third-party verifiers. Training and providing assistance to State and local jurisdictions has precedence. Many organizations already exist at the grassroots level within communities and cities such as Green Corps (http://www.greencorps.org/).

Recent action in the U.S. Congress shows some motivation to aid the enforcement of building codes. For example H.R. 4461 "Community Building Code Administration Grant Act (CBCAG)" passed the House of Representatives on July 9, 2008; if passed by the senate (S 2458), enacted, and funded, CBCAG Act would authorize a grant program through the U.S. Department of Housing and Urban Development (HUD) to provide competitive matching funds grants to local jurisdictions to build-up their building code administration and enforcement capabilities.

Broad Applicability. Building energy codes prescribe the minimum level of efficiency that must be achieved in new construction, both residential and commercial. In the residential sector, energy codes can impact construction practices in single as well as multifamily homes, and in manufactured housing, as well. In the commercial sector, energy codes can improve construction practices for schools, hospitals, large and small office buildings, warehouses, retail sales and service buildings, and religious as well as government buildings. Codes and code assistance programs can be flexible to meet the specific conditions of each climate zone in the United States and to take into account the demographics, social, cultural and economic development plans, and targets of State and local governments. Federal assistance programs shall allow local and State planners to meet their development and sustainability goals while simultaneously reducing energy costs and mitigating greenhouse gas emissions.

Significant Potential Benefits. The 2009 edition of the IECC – the National model energy code of choice for States, cities and counties – is expected to produce approximately 15 percent in energy efficiency gains compared to the 2006 edition, according to BCAP.[9] IECC 2006 had little thermal improvement over the IECC 2003 code, but it did simplify the process of compliance. Lucas (2006) estimated annual savings of 16-17 percent in West Virginia by adopting the 2003 IECC (unamended) in place of the 2003 IRC with amendments. The 2003 IECC and 2006 IECC are similar in efficiency requirements as the major changes are in ease of compliance and structure.

If every State adopted the most recent commercial and residential model energy codes, improved compliance levels, and applied model energy codes to manufactured housing, the United States would reduce energy use by about 0.85 quads annually, with cumulative savings through 2020 of about five quads. In 2020, annual consumer energy bill savings would be almost $7 billion, and the construction of 32 new 400 megawatt (MW) power plants could be avoided. Prindle et al. (2003) also estimate that upgrading residential building codes could save an "average" State about $650 million in homeowner energy bills over a 30-year period.

An estimated 0.15 quads of energy were saved in 1998 and 3.55 MMTC were avoided as a result of energy code upgrades through 1998 (this represents about one percent of the 318 MMTC emitted from the building sector in 2002). Rosenquist and coauthors (2004) estimate the nationwide energy savings potential from upgrading residential and commercial building codes in 2010 and again in 2020. Residential building codes are modeled in terms of improvements to shell measures such as insulation, glazing and infiltration that reduce heating and cooling loads. Commercial building codes are modeled in terms of improved space heating, air conditioning, and commercial sector lighting. The result is an estimated cumulative energy savings of 2.2 quads for residential building codes and 3.0 quads for commercial codes – totaling 5.2 quads over the 20-year period or an annual estimated potential savings of 0.26 quads (Brown and Southworth, 2008)

---

[9] http://www.iccsafe.org/news/nr/2009/0128_2009IECC.pdf

Assuming that all States have adopted the 2006 IECC by 2009 and subsequently more efficient codes every three years thereafter with a steady improvement in thermal performance, savings of about 1.6 quadrillion Btu, or three percent of projected residential and commercial consumption could be achieved in 2030. About two-thirds of these savings are estimated to come from improvements in residential construction. These estimates were derived by expanding the methodology described in the report *Energy Efficiency in Appalachia* (Brown et al., 2009) to the entire United States.

In that study, Appalachian States are assumed to adopt the 2006 IECC by 2009 and more efficient codes every three years thereafter. Codes are assumed to become effective the year following adoption. Third-party verification of measures occurs, and an incentive to builders is provided for the period 2010-2020. This results in an 80 percent compliance rate. To illustrate, the 419,000 single and multi-family homes projected to be built from 2013 to 2015 in Appalachia are assumed to conform to the 2009 IECC code and therefore use 18 percent less energy for space heating, space cooling, and water heating than they would have if built to 2005 current practice. Homes built from 2016 to 2019 are assumed to use 30 percent less energy for those end-uses. With $280 million in program spending and an additional $2.1 billion in customer investments over the 2010-2030 period, the Appalachian Region could see net cumulative savings of 1.0 quads of energy and $16.3 billion in energy bills by 2030 (Brown et al., 2009). The comparable savings for the United States are estimated to be almost 1.8 trillion Btu of savings for a combined public and private investment of less than $2 billion ($2006) (Figure 2.2).

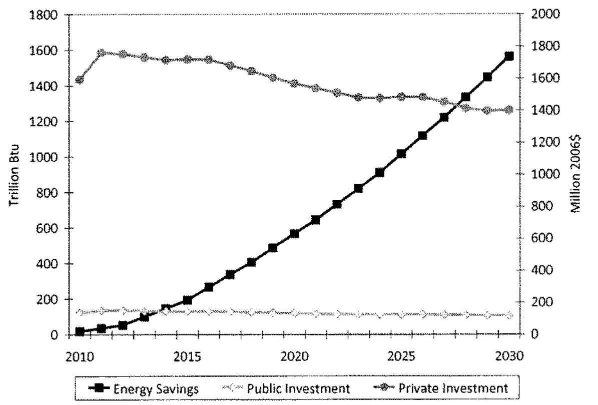


Figure 2.2 Costs and Savings in New Residential and Commercial Construction, 2010-2030
(Calculations by Chandler based on methodology documented in Brown et al., 2009)

While energy efficient building codes do present significant potential benefits, it should be restated that they do also create distortionary effects due to the time required to adopt and modify them. It should also be stated that building energy codes represent an efficiency "floor", while indicators such as ENERGY STAR certifications signify a higher standard in building energy codes.

Solutions not Dependent on Future R&D. Building energy codes are designed to require the use of current best practices and are not dependent upon future R&D successes. Because improved materials, technologies, and practices are anticipated in future years, most analysts assume that codes will be strengthened on a regular basis in order to reflect such advances. Indeed, there is a complementary relationship between building codes and R&D. Often the prospect of more rigorous codes in the future motivate manufacturers to invest in continuous product improvement. By making more efficient building designs and products the norm, efficiency standards can provide assured markets for innovative technologies. Updating building codes on a regular basis as building technologies and design strategies evolve can help expand the knowledge base and maintain a pipeline of new and improved technologies. The complementarity of regulatory approaches and technology innovation has been well documented in the case of the household refrigerator (National Academies, 2001). Recognizing that the building industry is one of the least research-intensive industrial sectors, public investment in R&D has been a critical source of technology advances that eventually become codified in State building requirements.

Cost Effectiveness. While the benefits are approximated above based on achieving growing savings, costs are not assumed to rise significantly over time (this assumes some amount of technological improvement and learning). The costs of residential code compliance can be estimated based on a modeled "standard home" in various climate zones, as shown in Table 2.1; however, due to differences in size and use of commercial buildings, offering a per building cost estimate is nonsensical.

Table 2.1. Incremental Cost Estimates for Residential Energy Code Compliance

(Brown et al., 2009, Table B-4)

State	**Code Studied**	**Climate Zone**[a]	**Cost Estimate (per home)**	**Reference**
Illinois	none to 2006 IECC	4	573-1715	Lucas 2007
Illinois	none to 2006 IECC	5	1173-3062	Lucas 2007
Iowa	1992 MEC to 2003 IECC	5,6	0-500	Lucas 2003
Kentucky	1992 MEC to 2000 IECC	4	0-300	Lucas 2001
West Virginia	2003 IRC amended to 2003 IECC	4	639	Lucas 2006
West Virginia	2003 IRC amended to 2003 IECC	5	659	Lucas 2006

[a] Climate zone is the 2006 IECC climate zone. Previous code cycles had more zones.

These costs are far less than the costs to bring existing homes to the same code because so much of a home's structure is easiest to change during construction – similarly for commercial buildings.

A recent (2009) study on the 13 States comprising Appalachia, by Brown et al. showed the savings in energy use by private and public investment in residential energy codes for the years, 2010-2030. Public investment is the administrative costs of the program while private investment is the incremental costs of improvement. Figure 2.2 shows the benefits of private and public investments in energy use from this study.

With cumulative $220.5 million in public investment and an additional $2.2 billion in private (customer) investments over the 2010-2030 period, the Appalachian region could see net cumulative savings of 802.5 trillion Btu, saving $13.1 billion in energy bills by 2030 (Fig. 2.2).

Figure 2.2 shows how energy bill savings might grow from 2010 to 2030 if residential and commercial codes improved over time on a three-year code cycle while costs stayed about even. Further, this figure assumes that public costs include training and liaisons, but not verification costs; private costs include incremental costs (at $1,000 per home and $0.30 per commercial square foot).

Administrative Practicality. Current code programs and training efforts exist, most notably the BCAP. Such programs offer an existing infrastructure for expanding efforts to advance State policies. The only "new" administrative effort would be enabling third-party verification at the State level. Federal assistance will help these governmental bodies and industry-based verifiers accomplish their goals while providing value to consumers.

Additionality. Building codes improve the energy efficiency of newly constructed dwellings and commercial buildings. Policies that improve information provided to potential building occupants or home buyers could have overlapping benefits as information could drive demand for further improvements.

Utility programs providing support to builders and the green construction industry could also provide complementary and supportive assistance. Utilities in several States offer residential and/or commercial new construction programs, which provide incentives to builders who meet or exceed model energy codes within the utility service area. Utility residential new construction programs have achieved near 100 percent compliance in California, Oregon, and Washington from builders while residences built outside of the program were found to be six percent (or more) less efficient than the current State code (Vine, 1996). An example program is that of Pacific Gas and Electric which provides an incentive of $400 or $500 to builders per ENERGYSTAR home and additional incentives for outfitting these homes with energy-efficient appliances (PG&E, 2008). It should be noted that these programs do have a verification component to determine qualification. Similarly, California's Title 24 Field Verification and Testing requires third party verification by Home Energy Rating System (HERS) inspectors that have certification through one of three approved certifying organizations upon installation or maintenance of specific technologies.[10]

---

[10] http://www.energy.ca.gov/2005publications/CEC-400-2005-044/CEC-400-2005-044.PDF

2.1.6 Summary

It is recommended that the Federal government expand technical assistance to States to accelerate their adoption of advanced building energy codes and provide financial assistance focused on third-party verification of code compliance. The absence of modern residential energy codes in 15 States in combination with low compliance levels in other States underscores the potential benefits that could result from this proposed Federal initiative. The challenge of establishing third-party verifiers to help enforce building codes is a potential weakness of this policy option that would require monitoring. While many developers, builders, and other stakeholders might oppose the enforcement of modern energy codes, consumers and society would benefit from this policy option in the long run, since many energy-efficient building designs and technologies are only affordable at the point of construction and are lost opportunities to future homeowners.

2.2 Expanded Use of Home Energy Performance Ratings

Policy Option: Provide technical and financial assistance to States to develop policies that incorporate home energy performance ratings and ensure a qualified home energy performance rating workforce.

2.2.1 Synopsis of Policy Option

Provide technical and financial assistance to States to develop policies that incorporate home energy performance ratings and ensure a qualified home energy performance rating workforce. As part of this effort, the Federal government could *develop a common home energy performance reporting method*, which will result in uniform data reporting.

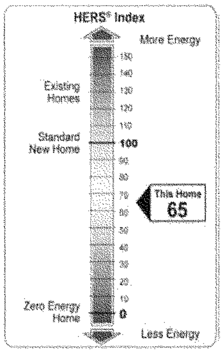
In addition, the Federal government could *coordinate training of a home energy rating and improvement workforce*. Since significant non-governmental capacity already exists for training this workforce, it may be most cost-effective to work within this structure.

Because this policy action directly influences States, State actions cannot be ignored. States will need to follow by developing policies that incorporate home energy performance ratings. These policies could be designed to verify building code compliance, to measure savings achieved by demand reduction efforts, or to help determine where the most need for improvement exists in the existing stock. States may need to take additional action, such as certifying companies that meet their criteria for training home energy performance ratings or developing a method of collecting and storing home energy performance ratings for public use.

2.2.2 Policy Experience

The Department of Energy (DOE) already supports State efforts to create home energy rating systems, and the Environmental Protection Agency (EPA) provides funding support to the Residential Energy Services Network (RESNET) and the National Home Energy Rating Systems Council.[11] Together they have developed rating guidelines for a particular home energy performance rating system called the Home Energy Rating System (HERS) and rater certification programs.

The HERS Index is a scoring system established by RESNET in which a home built to the specifications of the HERS Reference Home (based on the 2006 International Energy Conservation Code)[12] scores a HERS Index of 100, while a net zero energy home (NZEH) scores a HERS Index of zero. HERS was developed over about 19 years, from 1980 to 1999, through combined public and private efforts. In its infancy, the rating system was developed by the mortgage and real-estate industries as a way to include energy efficiency as part of mortgage considerations. In 1992, the National Energy Policy Act required development of voluntary rating guidelines to encourage home rating adoptions by States while the Housing and Community Development Act and the Veteran's Home Loan Amendment Act both required pilot testing of Energy Efficient Mortgages, based on ratings. In 1999, the National Association of State Energy Officials adopted guidelines for home energy ratings.[13]



Development and adoption of State and local policies using performance ratings has been mixed. While more than half the States have their own home energy performance rating systems, many are inactive, unproductive, or in a startup phase. Active home energy performance rating systems are in California, Colorado, Florida, Indiana, Utah, Vermont, and Virginia. A handful of States have more experience after being selected for pilot programs in the early 1990's (Alaska, Arkansas, California, Colorado, Vermont, and Virginia). However, programs in some States, like Alaska, Arkansas, and Colorado have lost ground after Federal pilot money ran out; State and local policies must follow that incorporate home energy performance ratings or organizations training and certifying raters will go out of business and their experience will be lost. States with successful home energy performance rating programs have multiple non-profit organizations serving as rating certifiers and coordinators for a network of professional raters and contractors.

---

[11] RESNET is a network of mortgage lenders, utilities, housing and residential energy efficiency professionals

[12] International Energy Conservation Code® (2006) http://www.iccsafe.org/e/prodshow.html?prodid=3800S06

[13] HERS history from : http://www.natresnet.org/ratings/overview/resources/primer/HP02.htm

Federal efforts to expand existing State programs could bring these organizations together to capitalize on decades of experience rather than funding only one organization.

An example of how to use the existing experience can be found in California's Home Energy Rating Systems program where the California Energy Commission approves providers to oversee home energy performance raters providing field verification and diagnostic testing – ensure quality supply. Field verification and testing is required by California law for new construction and renovations, which drives demand. Three organizations have been approved to act as providers so far: California Certified Energy Rating & Testing Services (CalCERTS), California Building Performance Contractors Association (CBPCA), and the California Home Energy Efficiency Rating System (CHEERS). CHEERS has certified more than 500 raters who performed about 20,000 home energy performance ratings in 2008, and it claims that ratings usually cost about $150 to $300.[14]

An example of how pilot programs can fail to work is in Colorado. There, non-profit organizations developed extensive experience training and certifying raters during pilot programs, but State and local policies have not followed to use the home energy performance ratings. Efficiency requirements placed on the States' largest utility, Xcel Energy, led the utility to develop incentives for customers to improve existing home efficiency. Xcel Energy contracted with one of the existing non-profit rater certifying companies, Lightly Treading, to provide steeply discounted home performance audits (added to monthly utility bill) to customers.[15] If the State had previously created an approved set of rating organizations, the utility may have worked with a consortium rather than one organization; now, the discounted ratings will likely drive consumers to Xcel Energy's program. The discounted ratings are not a problem in themselves, but they may lead to a loss of the collective knowledge embodied in raters and certifiers not associated with the program.

There is recent international experience for home energy performance rating as well. Following the European Union Performance in Buildings Directive (EPBD), all member countries are required to establish standard energy performance audits for existing homes. Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings required European member States to develop common rating schemes and put them into place by 2006 with a grace period for implementation until 2009.[16] This grace period is expected to be necessary to train inspectors (Wouters and van Dijk, 2007). The most popular form of compliance with the directive is the Energy Performance Assessment of Existing Dwellings (EPA-ED). EPA-ED is standardized to the point that assessors can follow a set of steps for data collection and then utilize EPA-ED software to provide location specific performance assessments; much freedom is allowed for local policy, technical specifications, and climate (Poel, van Cruchten, and Balaras, 2007).

---

[14] http://www.cheers.org/default.htm
[15] http://evstudio.info/2009/01/28/home-energy-audits-from-lightly-treading-and-xcel-energy/
[16] http://europa.eu/scadplus/leg/en/lvb/l27042.htm

2.2.3 Policy Rationale

Federal action could increase the use of home energy performance ratings, develop a common home energy performance reporting method, and coordinate training of a home energy rating and improvement workforce. Providing a standard method of measuring acts as an enabler; policies could be developed going forward with the idea that energy performance of homes is a known value. While it seems simple, this is a transformational piece of information. Home energy performance ratings could decrease information asymmetry about the residential building efficiency between builders or owners and users or buyers; in addition, home energy performance ratings could enable an array of policies to improve the energy performance of homes. For example, if home energy performance ratings were standard practice for compliance with energy codes, market risks to builders for complying with energy codes would be lowered.

2.2.4 Stakeholders and Constituencies

A home energy performance rating system has little benefit as a standalone policy; if policies to use ratings are not developed and ratings become required, there is likely to be disagreement on economic grounds.

Opposition to policies incorporating home energy performance ratings will be dependent upon the policies proposed. However, likely opposition will come from groups who disagree with the validity of the rating, or who stand to lose money. For example, construction companies may lose money in the short run if ratings become required to validate their compliance with energy codes – especially if they were previously getting by with non-compliance; however, compliant construction companies may not lose money and support such a policy that reduces their market risks.

As technologies and practices change, it will be important for the rating system (HERS or otherwise) to be flexible enough to adapt. Similarly, States and localities would benefit from making every effort to ensure that raters in place are familiar with the specific conditions of their climate and consider the type and use of dwellings when rating. This consideration is important because HERS estimates have been shown to be inconsistent, on an individual house basis, and dependent upon assumptions (like that the space is conditioned) that may be erroneous in some cases (Stein and Meier, 2000; Kordjamshidi and King, 2009). This is a note of caution when moving to a National system, not an expression that the HERS ratings are unreliable. Further, it supports the idea that ratings are appropriate for the building itself, irrespective of occupant (which could be public information), and for the building as occupied (private information).

Caution on this front is necessary to ensure that private information is not made public, at the same time that information that would not violate privacy is available for public use.

2.2.5 Policy Evaluation

Appropriateness of the Federal Role. Providing guidance, training, funding, and model legislation to States is already part of the Federal role in environmental and energy policy. Existing channels, including existing Federal programs could be used to help States develop policies that incorporate home energy performance ratings.

EPA uses HERS to qualify homes for its ENERGY STAR homes program. In addition, EPA developed Home Performance with ENERGY STAR, a public-private effort sponsored by States, local governments, and utilities. This is a fairly new program, with existing programs in a handful of States and several metro areas, but more than a dozen States are considering such a program (NASEO, 2008). Home Performance with ENERGY STAR strives to provide comprehensive, whole-house, energy audits as well as recommendations for cost-effective upgrades – much like a traditional HERS rating but with a focus on ENERGY STAR specifications. Additional efforts at the Federal level could coordinate State and local action by providing training or guidance to NASEO or specific jurisdictions as they consider adopting such a program.

The Federal Housing Administration has offered energy-efficient mortgages nationwide, based on home energy performance ratings, since October 1995. Fannie Mae, Freddie Mac, and the Veteran's Administration also offer energy efficiency loan products. Efforts to promote these existing financing mechanisms combine well with broader efforts to help consumers purchase homes that they can afford.

Seed funding for revolving loan programs for improvements that follow Home Performance with ENERGY STAR inspections or other home energy performance ratings could be implemented through existing State Energy Program or environmental funding mechanisms.

Broad Applicability. Home energy performance ratings are applicable to all housing; more than 112 million housing units are currently in place in the United States (Table 2.2).[17]

---

[17] There are more than 127 million housing units, but about 12 percent are vacant (U.S. Bureau of the Census, 2006; 2007; 2008a).

Table 2.2 Existing Occupied Housing Units by Census Region, 2005-2007
(U.S. Bureau of the Census, 2006; 2007; 2008a)[18]

Area	2005	2006	2007
Northeast	20,582,523	20,553,582	20,593,754
Midwest	25,603,971	25,688,303	25,778,315
South	40,712,300	40,963,290	41,381,254
West	24,191,823	24,412,227	24,624,654
U.S.	111,090,617	111,617,402	112,377,977

The way that home energy performance ratings are used in policies will affect their applicability. An ideal situation would have each dwelling rated at construction (for building "potential" rating), with each occupant (for "occupant-specific" rating, which includes behavior), and upon any renovation a new "potential" rating could be developed without considering current occupant behavior. Thus, the home rating is specific to the home, but actual performance and associated cost-effective improvements will vary by occupant characteristics. However, current costs of ratings relative to costs of energy consumption do not support this level of information collection and provision. Depending on State and local policies, the applicability of ratings will fall somewhere between the current use and the ideal described above.

Significant Potential Benefits. Simply adopting a rating system or training and certifying raters does not have any independent benefits. However, a rating system can provide information that is a catalyst for other action. Home energy performance ratings can be applied for different policy purposes. For example, buyers of rated homes can qualify for Energy-Improvement Mortgages, if the home's performance is poor, or Energy-Efficient Mortgages, if the home's performance is exemplary. Both of these financing options are currently underused; buyers and lenders alike are not fully aware of these programs through the Federal Housing Administration. The EPA lists several benefits of Home Energy Rating Systems combined with Energy-Efficient Mortgages[19]:

- More disposable income for homeowners.
- Higher property values for energy-efficient homes.
- Increased local employment opportunities in construction and retrofit projects.
- Greater use of energy-efficient technologies and practices.
- Larger loans for lenders.
- Reduced need for electricity generation.

---

[18] About 70 percent of U.S. Housing units are single family structures; about 25 percent are multifamily units; the remainder are mobile or manufactured homes (EIA, 2008a).

[19] http://yosemite.epa.gov/OAR/globalwarming.nsf/UniqueKeyLookup/SHSU5BUK22/$File/energyandthehome.pdf

- Reduced emissions of greenhouse gases and other pollutants such as nitrogen oxides.

In general, it is assumed that the benefits of home energy performance ratings would increase awareness of the homes' energy expense, much like EPA fuel efficiency stickers did for cars. Increased awareness along with recommendations for improvement, as provided with an energy performance rating, can help consumers make cost-effective investments that improve home energy efficiency. Getting existing homes down to a score of 100 could be a goal of energy efficiency retrofit programs. Table 2.3 shows what the HERS numbers mean; each one percent increase in energy efficiency corresponds to a one point decrease in the HERS index.

Table 2.3 What Does the HERS Number Mean?[20]

	HERS Score	**HERS Index**
Reference Home Score	Reference Home is assigned a HERS Score of 80	Reference Home is assigned a HERS Index of 100, while a net zero energy home is assigned a HERS Index of 0
Reference Home Basis	1993 Model Energy Code (MEC)	2006 International Energy Conservation Code (IECC)
Scale	Each 5 percent *increase* in energy efficiency corresponds to a 1-point *increase* in HERS Score	Each one percent *increase* in energy efficiency corresponds to a 1-point *decrease* in HERS Index
Energy Use Considered	Heating, cooling, and water heating	Heating, cooling, water heating, lighting, appliances, and onsite power generation
ENERGY STAR Requirement	HERS Score 86	HERS Index of 85 in climate zones 1–5 HERS Index of 80 in climate zones 6–8
Status	Phasing out; used for homes rated before July 1, 2006	Approved by the RESNET Board of Directors. To be implemented as of July 1, 2006.

If 100,000 (about 0.1 percent) average existing homes are retrofit each year to meet a score of at least 100 (from an assumed score of 120) this would represent a 20 percent decrease in energy consumption for those homes), annual incremental energy savings could be up to 230 GWh or 13,400 million cubic feet of natural gas, but is likely to be a combination of the two.[21]

---

[20] http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS

While it is beyond the scope of this proposed policy, data collected through home energy performance ratings could allow for detailed energy analysis and comparison by region and vintage, such data could help future research.[22] Current rating systems do not require systematic collection of data, nor is there funding for analysis of ratings in many areas.

Solutions not Dependent on Future R&D. The current barrier is a lack of skilled raters and workers who can build new structures requiring advanced framing and can install new equipment and technologies in homes required to meet the established HERS rating. This is not only true of new construction but is even more acute in existing buildings. Non-profit organizations have established a niche of training and certifying home energy performance raters; these organizations have more history and experience in States where pilot programs provided funding for their development.

Widespread use of home energy performance ratings will require a ramp up of efforts to train enough raters. Some areas may have many qualified raters, but they may not be prepared to complete the ratings necessary to support any larger effort. "In discussions with interviewees, it became apparent that energy auditing was not a primary profession for many certified energy auditors but an ancillary qualification." (MEEA, 2006 p. 20)

Cost Effectiveness. Assuming that a rating costs between $300 and $700, retrofits would need to lead to savings shown in Table 2.4. While saving 20 percent of average household electricity use almost pays back the lower estimate cost of rating in one year, nearly five years are needed to payback the higher rating cost using natural gas alone. This table illustrates the need to include the cost of rating in financing for retrofits and the need to achieve sufficient retrofit savings to cover the cost of rating in addition to the cost of the retrofit.

---

[21] This assumed savings is intentionally conservative – except with regard to the number of houses. 100,000 homes nationwide represents about 2,000 per state. There are not sufficient raters in some states to cover enough homes to achieve this number of homes that follow the rating with energy improving retrofits. Energy savings presented are based on saving 2,300 kwh or 13.4 thousand cubic feet per home based on average home energy use from 2005 Residential Energy Consumption Survey (RECS) Table US8. Average consumption by fuels used http://www.eia.doe.gov/emeu/recs/recs2005/c&e/detailed_tables2005c&e.html

[22] http://www.meteo.noa.gr/datamine/

Table 2.4 Energy Savings Required to Recover the Cost of Rating
(further savings would be necessary to cover the cost of retrofits)

	Price[a]	**Unit**	**Average Household Annual Use[b]**	**20 Percent of Average Household Energy Use (assumed saved)**	**Rating Cost**	
					$300.00	**$700.00**
Natural gas	$13.00	thousand cubic feet	67	13.4	23.1	53.8
Electricity	$0.11	kilowatthour	11,480	2,300	2,727	6,364

[a] Prices are National average prices for 2008 from the Short Term Energy Outlook, February 10, 2009 release. Table 2. U.S. Energy Nominal Prices http://www.eia.doe.gov/emeu/steo/pub/contents.html
[b] Average household consumption data from 2005 Residential Energy Consumption Survey (RECS) Table US8. Average consumption by fuels used http://www.eia.doe.gov/emeu/recs/recs2005/c&e/detailed_tables2005c&e.html

Cost-effectiveness is in the eye of the beholder; energy performance ratings that lead to energy-efficiency improvements can be seen as an additional "cost" of $300 to $700 on top of incremental improvement costs. While the average payback for retrofits is less than seven years, the payback for retrofits + rating will depend upon the retrofits that are undertaken. A home energy performance rating will seem very cost-effective when making expensive retrofits, but it may negate savings for less costly improvements, such as installing a programmable thermostat or upgrading lighting fixtures.

In New York, the average Home Performance with ENERGY STAR project house spent $8,369 in 2008 on retrofits and this program's average per house savings are 804 kWh/year and 420 Therms/year. New York's model is impressive because the contractors only charge what the market will bear for the rating and analysis; in competitive markets, this means that the energy performance rating is provided at no cost. Massachusetts's program completed 8,435 Home Performance with ENERGY STAR ratings, leading to $30 million in customer retrofits and 243,000 MMBtu annual savings over four years from 2003 to 2007. Maryland and the Mid-Atlantic Home Performance Collaborative demonstrate how States can work together to reduce administrative and program costs and share information.[23] These efforts show that consumers will undertake investments to improve the energy performance of their homes when they are provided with information on how to do it. Reaching more consumers this way could lead to significant private investment in energy efficiency.

In addition to supporting broader use of home energy performance ratings, Federal policy could include a robust monitoring, verification, and evaluation program. Evaluating the performance of existing home energy performance ratings and programs that use them will be necessary to ensure that the methods keep pace with the changing needs of consumers and the housing market. Evaluations should also consider improvements in home stock over time and make adjustments to policy if goals are not being met. Surveys of consumers could provide useful evaluative material on awareness, understanding, and value of home energy performance ratings. The costs of the program requirements to the public should be weighed against the energy benefits; however, driving energy benefits through such a program will take time. If the cost of home energy performance ratings is subsidized by Federal, State, or local government, benefits would accrue faster to consumers but costs would accrue to the government. Because widespread home energy performance ratings will require a large certification workforce, labor benefits will be immediately recognizable while benefits from energy savings will take time.

---

[23] Reported information from states on Home Performance with ENERGYSTAR is based on a webinar from NASEO (2008)

Administrative Practicality. This Federal action requires additional funding to existing training efforts; it also requires coordination for development of a common system of reporting. As such, the Federal administrative burden for this recommended program is low.

At the State and local level, ordinances may need to be amended to allow for home energy performance ratings to qualify for certain State and local building permits or programs. In addition, certification or acceptance of a rating method may require some legislation for those States that do not currently have rating systems in place or endorse home energy performance ratings.

Additionality. Because a rating system is an enabling policy, it is difficult to directly attribute benefits. However, ratings provide standardized information that consumers and policy makers alike can use. Other policies to improve information communication in the residential market will make the benefit of a rating system even harder to differentiate, but a suite of information efforts would be more effective than just a rating system.

2.2.6 Summary

It is recommended that the Federal government provide technical and financial assistance to States to develop policies that incorporate home energy performance ratings and ensure a qualified home energy performance rating workforce. Expanded use of home energy performance ratings can support a number of policies to reduce energy consumption in homes. In addition, as ratings become commonplace, homeowners will be able to judge homes by their energy performance as they do other obvious measures, like how many bathrooms it has. While home energy performance ratings do have a cost, they can be of value to policy makers and individuals. Their ultimate value will depend on the policies developed to interact with them.

3 Policies to Promote Energy-Efficient Improvements to Existing Residences

Energy efficiency improvements in older homes are often found to be highly cost-effective investment opportunities. Among the numerous strategies for cutting energy costs and carbon emissions, they are often seen as some of the most "profitable" approaches (McKinsey & Company, 2007). However, numerous market failures and barriers impede these investments; foremost among them are the problems of misplaced incentives and imperfect and asymmetric information.

Labeled the principal/agent problem by economists, this problem occurs when one party (the agent) makes decisions in a given market, and a different party (the principal) bears the consequences of those decisions. Such market failures were found by Prindle (2007) to be significant and widespread in many end-use markets in both the U.S. and other IEA countries. In many market situations, buyers purchase equipment on behalf of consumers without taking into account their best interests. Two types of *misplaced incentives* inhibit energy-efficient investments in the buildings industry:

- Architects, engineers, and builders select equipment, duct systems, windows, and lighting for future building occupants who will be responsible for paying the energy bills; and
- Landlords purchase appliances and equipment for tenants who then pay the energy bills.

The involvement of intermediaries in the purchase of energy technologies limits the ultimate consumer's role in decision making and leads to an under-emphasis on life-cycle costs. The problem is particularly difficult in rented dwellings, which constitute a large fraction of the U.S. housing market. Nearly one-third (32 percent) of U.S. households rent their homes. For this segment of the market, landlords have a powerful influence over the energy efficiency of the building structures and their equipment (Brown, Southworth, and Stovall, 2005).

The landlord-tenant relationship is a classic example of misplaced incentives (Murtishaw and Sathaye, 2006). If a landlord buys the energy-using equipment while the tenants pay the energy bills, the landlord is not incentivized to invest in efficient equipment unless the tenants are aware of and express their self-interest. Thus, the circumstance that favors the efficient use of equipment (when the tenants pay the utility bills) leads to a disincentive for the purchase of energy-efficient equipment. The case that favors the purchase of efficient equipment (when the landlord pays the utility bills) leads to a disincentive for the tenants to use energy efficiently (Ottinger and Williams, 2002). About 90 percent of all households in multifamily buildings are renters, which makes misplaced incentives a major obstacle to energy efficiency in urban housing markets.

Information barriers occur when consumers do not possess enough usable information to make decisions that are in their own best interest. These barriers are sometimes actually problems of asymmetry where one party (usually the seller) has information applicable to the transaction that the other party (usually the buyer) does not have. Sometimes information barriers are compounded by a *lack of trusted, actionable information.* While a vast array of facts and data is available to consumers, the information is often presented in terms that are not specific enough to the consumer to be useful or to drive change. In addition, the degree to which consumers act on information depends on the type of decision and the type of consumer; households report habitual energy savings more than purchasing efficient products, and pro-environment households tend to report more energy saving lifestyle choices than non-environmentalist households (Barr, Gilg, and Ford, 2005). These differences suggest that consumer education efforts should take into account the general perspectives of the target population.

The result of these market barriers and obstacles is a large backlog of energy retrofit opportunities. The following policy options would help to address these barriers to energy efficiency in the existing homes and in rental housing markets.

3.1 Mandated Disclosure of Energy Performance Information

Policy Option: Require disclosure of home energy consumption or home energy performance at the point of sale or lease of a residential unit.

3.1.1 Synopsis of Policy Option

Federal legislation could *require that information regarding the energy consumption or energy performance for a home be disclosed at the time the home is listed for sale.* States may need to modify existing disclosure laws to match this new Federal requirement.

Common reporting methods should be established concurrently to ensure potential buyers have access to the information before making a significant commitment to purchase or rent a home (Stern, S., 2005). In addition, *measurement and verification methods should be agreed upon* or allowed to be established by the States. Experience in Denmark shows that program effectiveness, and hence overall benefits, is tied to the degree of monitoring, verification, and evaluation to drive dollars where they are most effective. In older homes where efficiency upgrades will provide the most savings per dollar, audits should be more comprehensive (Ea Energianalyse, 2008). In newer homes, comprehensive, and relatively expensive, audits may not drive the level of investment required to recover costs in the near term. This is not to claim that newer homes do not face cost-effective improvements; rather, there is more low-hanging fruit in the least efficient homes, and this should be considered in implementation. In addition to vintage effects, there are likely regional effects that will also benefit from monitoring, verification, and evaluation.

The success of disclosure will require that the public understands and is comfortable with the material presented to them. Simple reporting methods as well as *public information or education campaigns* can help consumers interpret energy consumption and energy performance information disclosed to them. Consumers should be educated not only about the specific rating scheme, if one is created, but also on average consumption data, the benefits of greater efficiency, and the cost of retrofits. A case study in California demonstrated that consumer understanding of the meaning and usefulness of home energy performance data was a necessary prerequisite in most cases for consumer interest in home energy performance (Robert Mowris and Associates, 2004).

3.1.2 Policy Experience

Mandated disclosure policies are in place or under consideration in several jurisdictions both in the United States and abroad. Denmark and the Australian Capital Territory have had the most experience.

The policy form of mandated disclosure varies with two general types of information required at point of sale alone or in combination: *energy usage history or energy performance rating.* A more aggressive form of this policy – requiring a certain level of energy performance or level of expenditure on energy efficiency at the time of sale of a property – is in place in Berkeley and San Francisco, California, but its diffusion to other jurisdictions who have considered this policy form has been limited due to high associated costs, potential impact on home sales, local opposition, and income effects.[24] This document will consider mandatory disclosure as one policy, with discussion on areas where the two policy forms differ; final policy form is left to debate.

- *Energy usage history.* This policy form requires provision of energy consumption data to the buyer at the time of sale.

Montgomery County, MD, adopted an ordinance in April 2008 requiring that sellers, beginning in January 2009, provide an energy-efficient retrofit guidebook and 12 months of energy usage information, where available, to buyers (Montgomery County, 2008).[25] The council had initially considered requiring energy inspections at time of sale, but amended the bill because of the prospective costs and objection on the part of local home inspectors, who were anticipated to be allies; the bill sponsor claims that local realtors support the bill (Montgomery County, 2008).

---

[24] Requiring that homes meet a standard or are subject to a certain level of efficiency investment is not considered further in this document.

[25] Bill 31-07, Real Property – Energy Performance Audits; http://www.montgomerycountymd.gov/content/council/pdf/bill/2008/20080804_31-07.pdf

Disclosure of energy usage history will be most useful in comparison with the range and average consumption for similar dwellings. In regards to appliances, consumers were found to interpret energy labels (like EnergyGuide stickers) as certification of good energy performance (like ENERGY STAR) (Egan and Brown, 2001). Newer labels for appliances combine these information forms.

- *Energy performance rating.* An energy performance rating requires completing an assessment or audit of a home's energy performance and translating the results into an understandable rating system. There are varying degrees of complexity in audits and inspections used to create a rating.

Conducting a standardized inspection is much faster than providing a full energy audit. The report provided at the conclusion of an EnergyCheckup includes rating, comparison of current and after retrofit energy bill costs, and a list of recommended retrofits.[26] This method will be less accurate than a full audit, but offers reduced time and cost.

Australian Capital Territory (ACT) has required disclosure of home energy efficiency in all sales information since 1999; the ACT scheme is a star rating with more stars indicating greater thermal efficiency.[27] Australia is considering mandatory disclosure in all territories based on the experience in other areas, notably ACT and Denmark (Australian Greenhouse Office, 2005).

Following the European Union Performance in Buildings Directive (EPBD), all member countries are required to establish standard energy performance audits for existing homes. Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings required European member States to develop common rating schemes and put them into place by 2006 with a grace period for implementation until 2009.[28] This grace period is expected to be necessary to train inspectors (Wouters and van Dijk, 2007). The most popular form of compliance with the directive is the Energy Performance Assessment of Existing Dwellings (EPA-ED). EPA-ED is standardized to the point that assessors can follow a set of steps for data collection and then utilize EPA-ED software to provide location specific performance assessments; much freedom is allowed for local policy, technical specifications, and climate (Poel, van Cruchten, and Balaras, 2007). While it is beyond the scope of this proposed policy, uniform data collection in the rating or assessment could allow for detailed energy analysis and comparison by region and vintage.[29]

---

[26] http://www.energycheckup.com/content/MyRep_New.asp?Rid=2

[27] The original requirement for rating and disclosure was made in the Energy Efficiency Ratings (Sale of Premises) Act 1997; this act was repealed when the Civil Law (Sale of Residential Property) Act 2003 was passed since the newer law included energy efficiency rating disclosure as Part 3 of the Act. The current version, including amendments, can be found at http://www.legislation.act.gov.au/a/2003-40/current/pdf/2003-40.pdf. A description of the rating scheme is available from the Australian Capital Territory Planning and Land Authority: http://www.actpla.act.gov.au/topics/property_purchases/sales/energy_efficiency.

[28] http://europa.eu/scadplus/leg/en/lvb/l27042.htm

In Austin, Texas, the city council was considering requiring sellers to upgrade homes to meet efficiency standards prior to listing. The Austin Board of Realtors argued that performance disclosure protects the real estate agent and seller from legal action for poor performing homes; uniform performance disclosure also allows for market transformation (Chenevert, 2008). The final form of the ordinance, passed November 6, 2008, requires energy audits before selling homes with a voluntary program for implementing cost effective upgrades; it also sets targets for audits of multifamily units.[30] The voluntary upgrade program will be run by Austin Energy with a spending cap of one percent of the home's value for upgrades with a simple payback of not more than seven years.[31] The council's task force anticipates 85 percent of audited homes will participate in this voluntary program over the first four years.

Combined forms. Denmark has required energy disclosure on new and resale residential and commercial buildings since 1997; buildings are divided into three groups for rating purposes: Large, small, and industrial.[32] The Danish rating scheme includes a rating, plan for savings, and direct consumption information; ratings are required annually for large buildings and upon construction or point of sale for small buildings (Laustsen and Lorenzen, 2003). The Danish model used a combined building rating scheme that included electricity, heating, and water consumption histories, ratings, and combined environmental impact levels (Figure 3.1). With the passage of the EPBD, Denmark redesigned the policy to match EU goals (Law No. 585 of June 2005 "On the Promotion of Energy Saving in Buildings" and Decree No. 228 of April 2008 "On the Energy of Buildings"), and the associated label may have had to change as well. The new energy rating is longer, with recommendations for improvements included.[33]

---

[29] http://www.meteo.noa.gr/datamine/

[30] Only single family homes more than 10 years old require an audit; there are exemptions to the audit requirements for homes in foreclosure, those with recent efficiency upgrades, for low-income homeowners, and for historical and other types of structures (Ordinance No. 20081106-047). This ordinance can be found at http://www.cityofaustin.org/edims/document.cfm?id=123737

[31] These goals were established by the task force and formally adopted by the Austin City Council as Resolution No. 20081106-048 (http://www.cityofaustin.org/edims/document.cfm?id=123402).

[32] *Act to Promote Energy and Water Savings in Buildings No. 485 of 12 June 1996.* Denmark. http://soeg.ekn.dk/Afgorelser/L_585_Act_to_promote_energy_savings.pdf

[33] The example energy rating is available (in Dutch) at http://ens.dk/graphics/Energibesparelser/Ny_energimaerkningsordning_og_ny_kedelordning_PDF_filer/Eksempel_Enfamilieshus.pdf; no similar one-page label to the one published by Miguez et al. (2006) was found on the Danish Energy Agency website.

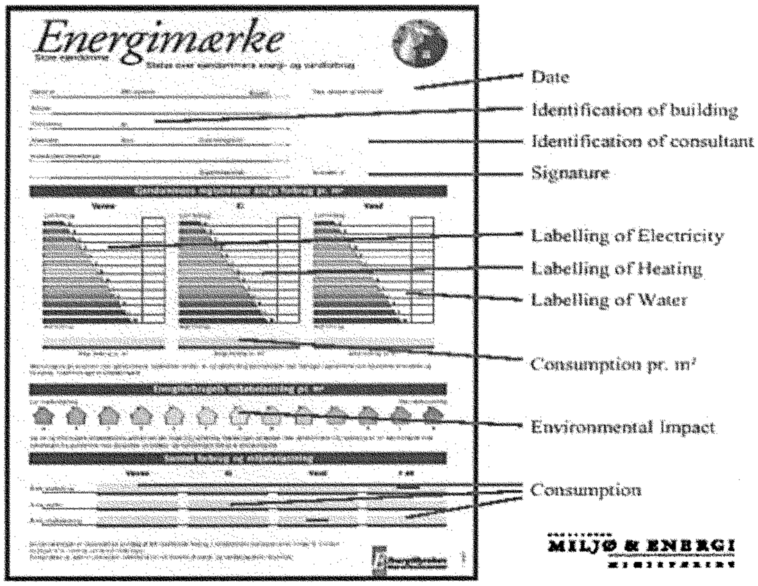


Figure 3.1 Energy Rating Form in use in Denmark
(Miguez et al, 2006, Fig. 3)

Denmark has shown sustained success with its consistent message. "Between 45,000 and 50,000 ratings per year are carried out, almost 70 percent of single-family dwellings are rated at the time of sale, and spending on energy in single-family dwellings has dropped by around 20 percent [since 1997]" (Miguez et al., 2006).

Several jurisdictions are considering combined form disclosure.

- Maine's SP 841 would require that new construction and significant renovations meet building energy code requirements and provide certification of energy performance to the first buyer; subsequent sales would require provision to the buyer of 24 months of consumption history and a report on thermal performance.[34]
- In Ontario, Canada, a bill has been introduced that would require disclosure of an energy efficiency audit for new homes followed by resale homes and those listed for rent (McNeely, 2008). Debate in the Ontario Legislative Assembly was supportive of the

---

[34] This bill has been postponed indefinitely. http://www.mainelegislature.org/legis/bills/bills_123rd/billtexts/SP084101.asp

intent and measure of this bill (Bill 101-2008); the bill was referred to the Standing Committee on Finance and Economic Affairs.[35]

- Denver, Colorado's council has considered a hybrid point-of-sale star rating system. This policy form assigns stars via a prescriptive checklist to three stars and relies upon performance (in the form of HERS ratings) for four and five stars. The policy form does not rely on HERS entirely due to anticipated inspection cost, lack of qualified raters, and HERS focus on energy per square foot, rather than total consumption.[36]

3.1.3 Policy Rationale

Mandated disclosure of energy performance information for housing units advertised for resale could help address the information gaps and misplaced incentives that pervade the existing housing market, leading to a backlog of energy retrofit opportunities. In the rental market, knowledge of a dwelling's efficiency can reduce the misplaced incentives on both the owner and tenant while helping renters ensure that the rent + utilities will remain in their budget.

Consumer's decisions to retrofit or upgrade homes to increase their energy efficiency are based on many factors including rising energy costs (and the expectation is they will not fall again), the ability to estimate a short term return on investment, sufficient income or financing options, and credible information on cost-effective improvements (Russell, 2006). In addition, consumers may upgrade windows and insulation for comfort reasons, even though the investments will not pay back during their residency and may not be reflected in the home's resale value. Comfort and amenities can be drivers, and energy efficiency an ancillary benefit. Mandated disclosure will provide credible information and should make identification of return on investment simpler; however, this research suggests that availability of loans to make improvements could drive greater retrofits. While this policy does not intend to provide financing or financial incentives, demand for efficient improvement of houses could lead to development of a private market for micro-loans, or consumers may make greater efforts to uncover other creative financing mechanisms.

Federal guidance can ensure consistency in definitions and presentation across States; consistency is important so that consumers can understand what is being disclosed and those who are conducting rating and assessments are doing so with a common technique and perspective.

The degree of variability across the nation for real estate disclosure is striking; there are more than 400 separate multiple listing services (MLS) in operation. MLS are not operated by realtor associations, but they do respond to realtor association input to determine their format. Alaska and Washington have a field for energy-efficiency ratings (Combs, 2008). Colorado and Wyoming have a field for energy consumption history and Utah has fields for yearly highs and lows; these fields are not used due to laws or guidelines declaring the information private, high potential for mistakes in entries, and a lack of support among real estate agents (Combs, 2008). Portland's Regional MLS has added several additional searchable fields, including certifications like ENERGY STAR, and products, like solar tubes (Hawkins & Shepherd, 2008). Other MLS may be following suit, but for realtors and consumers, the patchwork can be confusing.

---

[35] Text of bill discussion can be found at http://www.ontla.on.ca/web/house-proceedings/house_detail.do?Date=2008-10-16&Parl=39&Sess=1&locale=en#P951_316869

[36] www.recaonline.com/docs/arc/arc2008/PointofSale_DenverCO.doc

While the United States does not have to deal with the same language and governance barriers of the European Union, we can learn the value of a priori definitions and consistency for home energy performance disclosure (Casals, 2006). To the extent that information on energy consumption or performance is disclosed to buyers, standard methods of disclosing such information should be developed at the same time as the type of information is determined.

3.1.4 Stakeholders and Constituencies

Mandatory disclosure laws affect the day-to-day operations of MLS organizations and realtors; these two private actors will need to agree that the form of disclosure does not present an unnecessary burden to them. On the National level, the U.S. Green Building Council (USGBC) and the National Association of Home Builders are competing to make their standards "the standard," further adding to the confusion, there are over 80 State and local green building councils (Alsever, 2007).

States may have existing laws that conflict with mandatory disclosure of home energy performance.

Private actors who engage in home energy rating will be eager to drive the reporting requirements in a way that benefits them. Similarly, utilities may support or oppose mandatory disclosure depending on how the ruling relates to them.

3.1.5 Policy Evaluation

Appropriateness of the Federal Role. "As a general matter, government remedies are most suited to overcoming genuine market failures or government failures" (CCCSTI, 2009, p. 5). In the case of homes, the buyer (or leasee) must make a decision to purchase (rent) without knowing the energy consumption likely to be required to keep the home's interior within a healthy temperature range, operate a range of appliances, and provide sufficient lighting. Because the seller (leasor) is likely to be aware of their own prior consumption needs, the transaction occurs under asymmetric information, a classic market failure. OMB guidance suggests that policies or measures explicitly designed to alleviate asymmetric information should be given preference over other measures (OMB Circular A-4).[37]

Federal action to require disclosure of potential energy consumption information has precedent for appliances and automobiles; yet these objects have less of an impact on an individual's or family's energy consumption than their home.

Federal action to require disclosure of information pertinent to the sale of a home has precedent in the lead-paint disclosure. The Housing and Community Development Act of 1992, Title X (Residential Lead-Based Paint Hazard Reduction Act of 1992) requires that sellers disclose presence of lead-based paint to the extent of their knowledge; buyers are also provided with a brochure on the potential hazards of lead-based paint.[38] While it can be broadly argued that home energy performance is not a potential health hazard of the magnitude of lead-based paint, there are health benefits from better performing homes (Schweitzer & Tonn, 2002). To the extent that energy performance does contribute to improved health, especially among vulnerable populations, it may be sensible to establish authority for the program under the Office of Healthy Homes and Lead Hazard Control.

As such, *Federal action* to require disclosure of home energy consumption or home energy performance at the point of sale (lease) can be considered appropriate. Because real-estate transactions are generally a local matter, alternative Federal action to require or aid local governments in adoption of similar measures could be warranted. If this alternative action is taken, development of a model rule could reduce local promulgation delay while saving aggregate promulgation time and associated costs (Kaplow, 1992). Local governance is preferred over Federal action in most cases; the only concern is that fragmented local action can confuse buyers who often move between, rather than within, jurisdictions. This concern is highlighted in the cost-effectiveness section (2.1.5) of this document where the need for understanding and acceptance of the disclosure system, among buyers, is a necessary pre-condition to success of the program; varying methods for disclosure could significantly limit the capacity of buyers to use the information provided. Variation would also inhibit economies of scale in (1) the training and certification of auditors and home energy raters and (2) the provision of utility billing information from energy services companies doing business across multiple States.

Specifically pertaining to leases, the Federal government is already involved in promoting green leases in its own lease transactions. Also, the Federal government, through both the DOE and the EPA, provides extensive information on energy efficient practices. Offering useful information to promote the use of green leases, such as a Green Lease Toolkit, could easily be included in with current initiatives. This effort is currently focused on commercial space, but it could be translated to the residential sector.

---

[37] "A regulatory measure to improve the availability of information, particularly about the concealed characteristics of products, provides consumers a greater choice than a mandatory product standard or ban" (Circular A-4 p.9)

[38] 42 U.S.C. 4852d

Broad Applicability. The point of influence of this policy mechanism is when a housing unit is being sold.[39] Approximately five percent of the housing stock is sold each year, with turnover varying slightly by region (Table 3.1). Thus, while the program is applicable to all existing homes; it will reach about one-quarter of the housing stock over five years. Individual housing unit turnover rates vary, and some housing units may never turn over; despite these limitations, a sustained disclosure program will reach most housing units by 20 years.[40]

---

[39] The potential for savings in the rental market is less clear (leasees still have no incentive to improve their leasor's property); therefore, savings estimates from green leases are not included here. However, renters could demand more efficient properties and drive investments by owners.

[40] The U.S. Real estate market has experienced a downturn since 2005; if the market becomes more active, housing turnover could be accelerated or vacant homes may become occupied.

Table 3.1 Existing Occupied Housing Units and Home Sales by Census Region, 2005-2007
(NAR, 2008; U.S. Bureau of the Census, 2006; 2007; 2008a)[41]

	2005	2006	2007
Northeast			
Housing Units	20,582,523	20,553,582	20,593,754
Existing Home Sales	1,169,000	1,086,000	1,006,000
Percent Sold	5.68	5.28	4.88
Midwest			
Housing Units	25,603,971	25,688,303	25,778,315
Existing Home Sales	1,588,000	1,483,000	1,327,000
Percent Sold	6.20	5.77	5.15
South			
Housing Units	40,712,300	40,963,290	41,381,254
Existing Home Sales	2,702,000	2,563,000	2,235,000
Percent Sold	6.64	6.26	5.40
West			
Housing Units	24,191,823	24,412,227	24,624,654
Existing Home Sales	1,617,000	1,617,000	1,084,000
Percent Sold	6.68	6.62	4.40
U.S.			
Housing Units	111,090,617	111,617,402	112,377,977
Existing Home Sales	7,076,000	6,478,000	5,652,000
Percent Sold	6.37	5.80	5.03

Significant Potential Benefits. Providing potential home buyers with consistent, understandable information on home energy consumption or performance provides several benefits that lead to the targeted benefit of improved efficiency of the existing housing stock: addresses key information barriers, internalizes value for energy performance in homes, and provides for development of uniform system of describing or assessing home energy performance to prevent 'greenwash'. The only quantified benefits are for reduced energy consumption, presented in terms of the energy costs avoided by consumers.

Address key information barriers. If properly informed, buyers could drive the market to greater efficiency. If an assessment is not made at the time a property changes hands, and home energy performance remains unknown, the resident or owner will be even less likely to make improvements, even cost-effective ones. So long as the information about the home's energy performance is known to the buyer and the seller, they will be able to work from the same set of knowledge to agree on a fair selling price (Freeman and Kolstad, 2006).[42] Providing information on the home's characteristics is not found to harm the seller; rather sellers offering State mandated disclosure forms before purchase increase buyer confidence and is correlated to higher home sale prices (Nanda and Ross, 2007).

---

[41] About 70 percent of U.S. Housing units are single family structures; about 25 percent are multifamily units; the remainder are mobile or manufactured homes (EIA, 2008b).

Internalize value of home energy performance. Research shows that buyers shop around and compare homes based on their features. In 2008, the average buyer viewed 10 homes over 10 weeks before making a purchase (NAR, 2009). While it was not one of the most demanded features, energy efficiency was important to 92 percent of home buyers in 2006 and 2007 (NAR, 2007). Consumers likely did not demand energy efficiency with the same vigor as other features because energy performance is intangible; potential home buyers cannot look at it and compare homes. Efficiency features are "decidedly unsexy" compared to features like designer kitchen and bathroom counter tops and fixtures (Alsever, 2007). In addition to their being invisible, efficiency features may not appear as core attributes of a home; mandatory disclosure of energy performance can move these features from auxiliary to core attributes and thereby increase their value (Faiers, Cook, and Neame, 2007).

Uniform system of assessment. Federal disclosure rules allow for uniform presentation of information across the country. Today, consumers are provided with several potential metrics or products they must navigate. On top of disagreement and confusion for what should be considered efficient or green, finding a green or efficient home based on any of these standards is a challenge. For example, ListedGreen.com attempts to connect buyers and sellers of environmentally advanced properties, but buyers are likely to overlook this site in favor of more general listings.[43]

Improved efficiency of the existing housing stock. Only twelve percent of occupied housing units in the United States in 2007 were constructed in 2000 or later; Table 3.2 shows the distribution of vintage for occupied housing units in the United States (U.S. Bureau of the Census, 2008b). Almost three-quarters of occupied housing units were built prior to 1990; widespread adoption of building energy codes did not occur until required in the Energy Policy Act of 1992, which amended the Energy Policy and Conservation Act of 1975 (Public Law 102-486).

---

[42] Freeman and Kolstad (2006) argue for seller to buyer disclosure in reference to industrial sites; while they are concerned with environmental contamination rather than energy consumption, the point is the same.

[43] A search on January 23, 2009 found only 128 listed properties in the United States, so sellers may also overlook this option to avoid only reaching a niche-market. http://www.listedgreen.com

Table 3.2 Vintage of Occupied Housing Units in the United States, 2007
(U.S. Bureau of the Census, 2008b)

Year Structure Built	Percent of Occupied Housing Units	Margin of Error
2000 or later	12.0	±0.1
1990 to 1999	14.2	±0.1
1980 to 1989	14.2	±0.1
1960 to 1979	28.2	±0.1
1940 to 1959	17.4	±0.1
1939 or earlier	14.0	±0.1

Due to the lifetime of homes, efficiency not achieved at construction or during major renovations is essentially a lost opportunity. Home buyers who are aware of the home's energy performance will be better prepared to adopt more efficient technologies and materials when those are needed or upon desire to improve comfort or reduce energy expenditure.

A pilot program in northern California recruited and trained home inspectors to offer prospective home buyers the opportunity to purchase an additional inspection, an energy inspection called EnergyCheckup, at the time of routine home inspections before purchase. Those who did purchase the EnergyCheckup rated the inspection information as reasonable, applicable, and informative; these buyers later adopted 46 percent of the recommended measures to improve their home performance. This number supports the theory that consumers are willing to pay for improved energy efficiency when well informed (Robert Mowris and Associates, 2004). Evaluators find that the program demonstrated the net-present avoided costs of EnergyCheckup at time of sale to be $208 per home (Robert Mowris and Associates, 2004).

Actual benefits will vary by home, with older homes having the greatest savings from efficiency upgrades. The value of benefits will vary by cost; where energy is most costly, efficiency upgrades will be most beneficial from a monetary perspective. Research also shows that savings, for the median home, in the most energy-consuming end-uses, space heating and space cooling, vary dramatically by region (Table 3.3).

Table 3.3 Estimated Utility Bill Savings after Switching to ENERGY STAR or Best Available Technology

(Mills, 2007, Table 27 p. 55)

Census Division	Percent Bill Savings for Energy-Efficient House				
	Space Heat	Space Cool	Water Heat	Appliances	Total Bill
New England	63	33	50	35	49
Mid Atlantic	66	33	50	33	47
East North Central	66	62	50	33	49
West North Central	66	59	50	34	52
South Atlantic	65	62	43	35	50
East South Central	65	62	43	35	49
West South Central	67	62	50	35	53
Mountain North	66	62	50	35	48
Mountain South	65	62	43	35	48
Pacific North	65	62	43	35	63
Pacific South	67	62	50	34	47

The Home Energy Saver results shown in Table 3.3 are based on adoption of the best available technology, and may not be cost-competitive (Mills, 2007). For the purposes of this report, a more conservative estimate of savings is made based on the weatherization program, rather than assuming that retrofits will adopt all best available technology. Based on a meta-analysis of weatherization savings, electric-heated homes save 10.5 percent of pre-weatherization whole-house electricity consumption and gas-heated homes save 21.9 percent of pre-weatherization whole-house gas consumption, with average annual site energy savings of 29.1 million Btu (Berry and Schweitzer, 2003). The weatherization program is targeted to low-income consumers who are also likely to live in older but smaller homes; thus, the savings and the retrofit costs may be higher or lower than in the general population.

To assume benefits for the disclosure program and not retrofit, in general, this study assumes that one-third of home buyers, an estimated two million homes per year (less than the 46 percent offered by Robert Mowris and Associates (2004), to be conservative) adopt sufficient retrofits to achieve savings of 29.1 million Btu. This translates into an annual incremental savings of 58.2 trillion Btu. Over time this level of annual savings will shrink as the same homes re-enter the resale market. It is estimated that over a 10-year period, perhaps 0.5 quadrillion Btu could be saved, or approximately 0.5 percent of total U.S. energy consumption.

Solutions not Dependent on Future R&D. Requiring the disclosure of energy consumption histories, energy features, or energy performance ratings when housing is advertised for sale could be implemented immediately. It does not rely on R&D or future technologies. Energy performance rating systems already exist, as do audit and inspection protocols.

Cost Effectiveness. The cost-effectiveness of the program will depend upon its final form and future energy prices. The benefits of a successfully implemented home energy disclosure program have been described above. Because this policy is not directed at retrofits, rather providing information to allow the market to drive retrofits, costs of actual retrofits are excluded from the policy consideration.

In terms of cost, the least costly measure is to require provision of consumption history from sellers or utilities while the most costly form would require detailed assessment of home energy performance at the time of sale. Providing assessment through a checklist will cost less than requiring assessment of home energy performance through an audit system. For each policy form, cost-effectiveness is presented here based on previous experience or based on estimates of costs and benefits under the assumption of six million housing units sold per year. Assume that administration, marketing, monitoring, verification, and evaluation are fixed costs regardless of policy form. Assuming that these will cost about $50 ($25 per home estimate for provision of these, offered by Robert Mowris and Associates (2004) ignores the higher costs at the beginning of such an effort); fixed costs are estimated at $300 million per year. These costs are expected to decline overtime as experience develops.

Energy usage history. Disclosure of energy consumption histories will require consumption history for a residence to be provided at the time of sale by sellers or energy providers. Provision by sellers is anticipated to be less costly than provision by utilities; however, sellers who are unprepared will likely rely upon the utility for provision of information. As consumers learn the requirements of the policy, they will be more likely to maintain bills in preparation for future sale of their homes. Reliance on individual consumers learning is not recommended because of time lags; rather, active consumer awareness programs should make consumers aware of their role.

Electricity and natural gas consumption data is maintained by utilities and is available to customers upon request; in some cases, usage history is available online to customers. As a result, complying with this policy would be relatively inexpensive for both the utility and the homeowner. Utilities are already reporting a vast amount of information about their operations with minimal reporting burden; for example, EEI estimates that it takes 1.2 hours to respond to file an EIA-825 form on monthly electric sales and revenue (Bartholomot, 2007). Reformatting consumption information already provided to consumers should take much less time. Reporting consumption history is more costly for the significant percent of U.S. homes using other fuels such as natural gas (62.5 percent) kerosene (1.5 percent), fuel oil (7.7 percent), or propane (11.3 percent), where different suppliers may have sold these fuels to a homeowner over the course of several years, potentially not under long term contracts (EIA, 2008c). Providing the same information for consumption of wood or other materials (13 percent) will likely not be feasible (EIA, 2008c).

While home sellers may only be expected to provide numbers taken from their bills, utility provided home energy usage information may be more detailed, depending on the utility. Arizona Public Service (APS) has made available average billing costs (rounded to $5) for the last 12 months for any address serviced by them; interested parties simply enter a valid address in a web form.[44] Similarly, Xcel Energy will provide high, low, and average gas and electricity consumption data for any address serviced by them. NorthWestern Energy allows real estate agents access to energy usage information for the properties they represent.[45] Progress Energy allows customers to access energy usage information online, providing graphs (Figure 3.2).

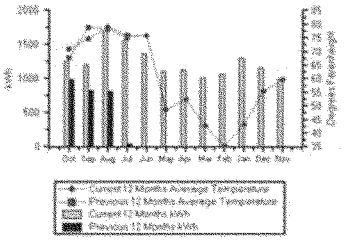


Figure 3.2 Progress Energy Example Energy Analysis Graph: "Most Recent 12 Months Compared to Previous 12 Months"[46]

If data collection is conservatively estimated at one hour per home, and $20 per hour – either a waged utility employee or a seller must spend their time on this activity rather than something else, this policy form (Energy usage history) would cost about $120 million per year, in addition to fixed costs (total of $360 million per year).

Energy performance rating. The city of Seattle's Green Building Task Force has considered mandatory disclosure through reporting of energy consumption history or performance audit/rating schemes; they concluded that an audit or rating would be more expensive than reporting consumption history but still administratively feasible (GBTF, 2008).

---

[44] http://www.aps.com/customer/addressSearch.asp

[45] http://www.northwesternenergy.com/display.aspx?Page=Real_Estate_Agent%E2%80%99s_Corner&Item=103

[46] http://www.progress-energy.com/custservice/carres/myaccount/energyanalysisgraphdemo.asp

Energy rating in Denmark costs about 4500 Kroner for dwellings; this is about $770 (Ea Energianalyse, 2008).[47] An ordinance in Austin, Texas, requiring energy performance audits at time of sale doesn't go into effect until June 2009, so actual costs are still unknown; audits are expected to cost between $200 and $300.[48] In Kansas, estimates for the cost of energy audits are higher, from $350 to $500 (Bell, 2008). Realtors in Kansas also argue that there are not enough raters to support point of sale audits in the State (Bell, 2008). Availability of trained inspectors or raters will ensure disclosure is based on technically proficient assessment and lead to reduced costs.

For the EnergyCheckup program described earlier, evaluators claim that a similar program could be designed to provide inspections at a cost of $95 per home, broken down as follows: $25 for administration, marketing, and verification, $40 direct to inspector, $25 in "free" energy efficiency kits for real estate agents to give to buyers at closing, and $5 for training and technical support (Robert Mowris and Associates, 2004). For this particular study, benefits were estimated at $208 per transaction, implying a Total Resource Cost measure of 2.1 (Robert Mowris and Associates, 2004). EnergyCheckup is proprietary software and inspection methodology, from GeoPraxis, that takes 30 minutes and claims to be as accurate as a three to four hour energy audit.[49]

If a standardized inspection and rating can be provided at $70 per home, the lowest cost end of this policy form would cost an additional $420 million per year (total of $720 million per year). If an individualized comprehensive rating can be developed from $200 to $770, this policy form would cost an additional $1.2 billion to $4.6 billion per year (total of $1.5 billion to $4.9 billion per year).

Evaluating the performance of a disclosure program will be necessary to ensure effectiveness and sustainability of providing home energy performance information. Evaluation should also consider the benefits to homeowners of having home energy performance information at the point of sale. Survey of consumers could provide useful evaluative material on awareness, understanding, and value of the program. The costs of the program requirements to the public should be weighed against the energy benefits; however, driving energy benefits through such a program will take time. Unless disclosure is through energy consumption history, costs will likely outweigh benefits for the first few years in all areas except labor. Because mandatory disclosure of home energy performance will require a large rating workforce, labor benefits will be immediately recognizable while benefits from energy savings will take time.

---

[47] Currency converted on January 23, 2009 at http://www.x-rates.com/calculator.html

[48] Austin City Council Resolution No. 20081106-048 http://www.cityofaustin.org/edims/document.cfm?id=123402)

[49] http://www.geopraxis.com/content/pressrelease.asp?id=5

Administrative Practicability. While there is limited experience with policies for disclosing home energy information, especially at the National level, the administrative burden is anticipated to be low.

The Office of Energy Efficiency and Renewable Energy already offers information on green leases for the commercial sector.[50] Additional information on residential green leases could be added without creating a new program or incurring significantly greater expense.

A reporting burden will be created for those listing properties for sale or rent, and a monitoring and verification burden will fall on whichever agency is charged with ensuring that energy performance information is disclosed. Common reporting requirements and an informed public could ease identification of failure to disclose.

Additionality. Mandatory disclosure of home energy performance is a policy tool to address the policy issue of increasing efficiency in the existing stock of homes, many of which were built prior to widespread adoption of building energy codes. While this policy document has presented three different ways to implement disclosure, there are competing policy options to address energy use in the existing home stock. Almost all realistic policy options attempt to increase the efficiency and rate of turnover of built-in components of existing housing stock.

For example, consumer information campaigns tend to have limited direct value because consumers either do not to see the material as applicable to them or do not understand how to translate generalized information into actions. Even highly motivated consumers tend not to use this information productively (Desmedt, Vekemans, and Maes, 2009).

Related policies that appear to be effective at tackling the energy-efficiency gap in existing residential buildings are numerous, and therefore could capture some of the energy savings estimated for the mandatory information disclosure policy discussed in this paper. They include utility-operated demand-side management programs and on-bill financing of energy efficiency, decoupling of utility profits from energy sales, appliance and equipment standards, expansion of low-income weatherization, tax credits or refunds for efficient major purchases, consumer information campaigns on benefits of efficiency, and training programs for remodeling and repair professionals.

---

[50] http://www1.eere.energy.gov/buildings/commercial/leased.html

3.1.6 Summary

Federally mandated disclosure of home energy performance before sale or rent of property is recommended in conjunction with common reporting methods, consumer education, and a robust monitoring, verification, and evaluation program. This policy will increase costs of purchasing or renting a home, and may create a reporting burden. However, providing potential home buyers with consistent, understandable information on home energy consumption or performance provides an opportunity for market transformation as efficiency becomes observable; this is in line with Federal regulatory goals of reducing information asymmetry. Over time, such a policy could drive substantial savings in home energy consumption.

3.2 On-Bill Financing of Energy-Efficiency Improvements

Policy Option: Provide financial assistance to State Energy Offices to establish revolving loan funds to enable on-bill utility financing of energy-efficiency improvements without up-front capital costs to the building owner.

3.2.1 Synopsis of Policy Option

The Federal government could encourage energy-efficiency investments in existing buildings by enabling State Energy Offices (SEOs) and utilities to offer on-bill financing to building owners. In the proposed financing scheme, the Federal government would provide seed money and program guidelines for revolving loans implemented through States. States would have the flexibility to determine their own program administrators and specific rules. However, State programs should include certified and bonded auditors and contractors competitively selected to promote quality and cost-competitiveness, and to ensure that monthly repayment obligations by consumers are less than the energy bill reductions from the energy savings.

In our recommended policy approach, supporting roles would be played by six organizations (Figure 3.3):

- The **U. S. Department of Energy** (DOE), which provides funding to SEOs to establish revolving loan funds to utilities that finance energy-efficiency improvements by their residential and small commercial customers.
- An **SEO** responsible for the successful implementation of the program in its State. The SEO would establish a revolving loan fund to finance the program and would competitively contract with companies to deliver energy audit and installation services. The SEO would also help market the program to potential participating customers

(perhaps in collaboration with utilities) and would provide summary program performance statistics to DOE annually.

- One or more **electric or natural gas utility** that is willing to put a charge for energy-efficiency services on their monthly bills to customers, and transfers these funds back to the SEO to replenish the revolving fund.
- **Energy customers** willing to pay for the retrofit work through their utility bills. Their willingness to pay is contingent on the monthly repayment obligation being less than the energy bill reductions from the energy savings. It is also important that any unpaid obligations transfer to subsequent building owners.
- A certified and bonded energy **auditor** to recommend proven retrofit measures and verify afterward that the work was done correctly. Completion of a Home Energy Rating (or comparable rating for a small commercial building) would be an integral part of the auditor's responsibility, as would an inspection of the building after the contractor has completed the energy-efficiency upgrade.
- A certified and bonded **contractor** to install the energy-efficiency improvements. The pool of certified contractors available to program participants would be competitively selected by the SEO.

A similar arrangement could be used to finance renewable energy installations on customer properties.

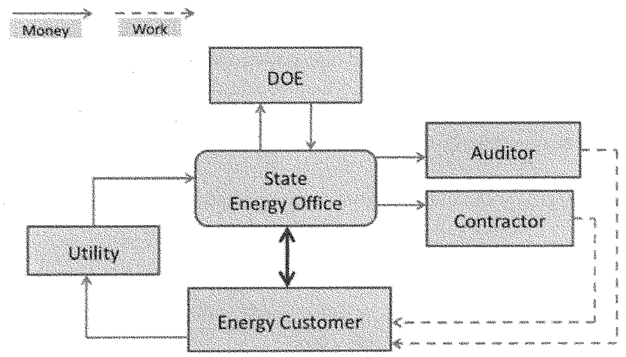


Figure 3.3 Conceptual Organization of an "On-Bill Financing" Program
(Source: Revised from Rogers, 2007)

A nontraditional financing scheme could be designed in different ways by changing the funding source, the implementing authority, or the method by which repayment is collected. Potential funding sources include: Federal, State, or local government agencies, banks or other lending institutions (perhaps with a Federal guarantee), third parties (energy services companies, for example), or utility funds. Either the utility, the State, or a third-party firm could effectively serve to implement such a program. Determining the terms of repayment could be accomplished through forecasting savings via engineering calculations, audit-based estimates, or by comparing consumption before and after the improvements are made.

On-bill financing programs are designed to help customers pay for energy-efficiency upgrades through energy savings. The effectiveness of this type of program is greatly enhanced by partnering with utilities because they already have an established billing relationship their customers, and they have access to information about energy usage patterns and payment histories.

Joel Rogers (2007) has developed an organizational model of an on-bill financing approach called "Pay-As-You-Save" with features that address the issues identified as barriers in the past. PAYS™ is comprised of six generic players – offering a type of mix-and-match approach with great flexibility. We have taken these six roles and defined specific types of organizations for each, thereby fitting the PAYS™ approach to the opportunity presented by the 2009 American Recovery and Reinvestment Act. Matthew Brown (2009) also discusses two related financing mechanisms: on-bill financing through a utility tariff (tariff-based systems) and on-bill financing through loans from the utility company (on-bill loans). In both cases, the utility pays for the full installed cost of the efficiency measures and the consumers pay a monthly fee on their bills to compensate the utility.

The program design described here is unique in terms of the proposed role of Federal and State government agencies and the reliance on a revolving loan fund to promote the long-term success of the effort.

3.2.2 Policy Experience

On-bill loan programs currently exist in many states. Indeed, a review of residential efficiency financing programs in the U.S. and Canada by Fuller (2008) identified 18 programs in operation across the country. Capital for these programs came from a variety of sources including lender funds, internal utility funds, and public benefits charges. The most common financing mechanism was an unsecured consumer loan (Fuller, 2008, p. 37). This approach is quite distinct from the program design being proposed in this paper, which would rely principally on federal revenues passed through State Energy Offices and utilities to individuals.

Most on-bill loan systems have focused on small business or government sectors, with large average loans (e.g., up to $250,000 per project) and subsidized low-interest rates (Brown, M., 2009). The Alabama and Arkansas programs are the only ones that focus principally on the residential sector. Unfortunately, the results of these residential programs are not well documented. The program in Connecticut, operated by the United Illuminating Company has been very successful, with a focus on commercial and industrial customers. The program financed 310 projects in 2006 and saved 5.8 MWh (Brown, M., 2009). The Sempra Energy program in California also focuses on business and government customers uses state public benefits funds to buy down interest rates and subsidize the loan program's capita. The Sempra Energy program does not offer loans to residential customers because consumer finance laws in California impose restrictions and additional fees on companies offering residential financing (Brown, M., 2009)

There are two Federally-backed financing vehicles already in place that target existing residences for improvements: Fannie Mae's Energy Efficiency Loan (through utilities) and Energy Improvement Mortgages (through banks and other lending institutions). However, success with these programs has been limited.

Fannie Mae's Energy Efficiency Loan product allows for homeowners to enter into retrofit contracts without paying for them upfront. Contractors are paid directly from a loan administrator, and homeowners pay the unsecured loan. Figure 3.4 shows the loan process from ViewTech, a financial services company that specializes in energy efficiency financing from government and utility funds.[51]

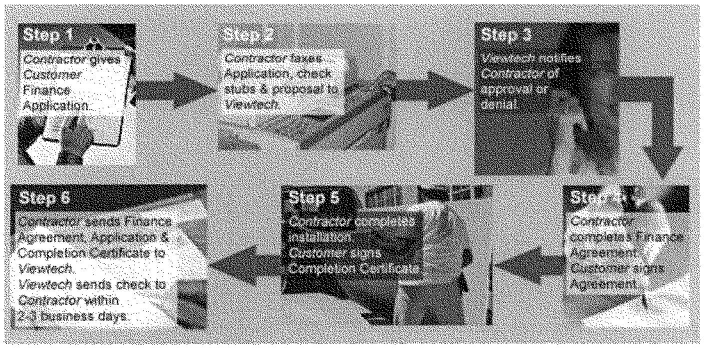

Step 1
Contractor gives Customer Finance Application.
Step 2
Contractor faxes Application, check stubs & proposal to Viewtech.
Step 3
Viewtech notifies Contractor of approval or denial.
Step 4
Contractor completes Finance Agreement. Customer signs Agreement.
Step 5
Contractor completes installation. Customer signs Completion Certificate.
Step 6
Contractor sends Finance Agreement, Application & Completion Certificate to Viewtech. Viewtech sends check to Contractor within 2-3 business days.

Figure 3.4 Fannie Mae Energy Loan Process
(Source: http://www.energyloans.org/body_process.html)

---

[51] The level of activity by consumers in these financing vehicles is largely dependent upon the state policy environment and the home owner's ability to qualify for FHA or VA loans (Farhar et al, 1997).

While they generally do not perform the work or provide savings guarantees, several utilities offer on-bill financing for residential customers. The utilities offering these loans are using Fannie Mae funds in many cases, and they are self-funding in others. Utilities gain little in the way of risk protection from default, as Fannie Mae will cover only 1.5 percent of risk of loan losses for a fee.

An example of an existing on-bill financing program currently serving homeowners is the First Electric Cooperative of Arkansas' Home Improvement Loan program. This program grants loans to homeowners up to $15,000 for heat pumps, efficient water heaters, and other electric service upgrades. Items purchased are applied to the electric bill and paid in installments, with term lengths varying depending on the size of the loan.[52]

While achieving energy-efficiency upgrades for many of its homeowners, this program has four important and interrelated weaknesses:

- the need to avoid losses significantly limits entry to "qualified debtors,"
- energy savings are not guaranteed,
- payments are made based on traditional loan terms rather than energy savings, and
- the loan contract is with the current homeowner without transfer.

In plain terms, these loans only partially address barriers to energy improvement for existing homes and small businesses, and then only for a subset of these markets.

In the case of Energy Improvement Mortgages, the design is based on energy savings (in dollars each month) being greater than the amortized improvement loan, as described by a home energy rating. This design should limit defaults, and it offsets the potential problem of not having payments based on savings. However, these mortgages must be requested by the homeowner upon financing or refinancing a home, and the homeowner must present the results of a home energy rating to the lender. Thus, the homeowner has had to pay a few hundred dollars for the rating and find themselves inconvenienced by the level of coordination and paperwork required to get into one of these mortgages. While Energy Improvement Mortgages can be considered a good idea, consumers do not often seek these because they either do not know about them or think it not worth it to pursue them.

Several programs exist or are in the process of being established that have many of the desirable attributes of utility on-bill financing.

---

[52] http://www.firstelectric.coop/content.cfm?id=2023

In 2001, the New Hampshire Public Utilities Commission authorized pilot programs by the New Hampshire Electric Cooperative (NHEC) and the Public Service Company of New Hampshire (PSNH). Both pilots provided no-cash-upfront energy-efficiency improvements, with prepayment through electric bills. PSNH targeted municipal buildings, while NHEC targeted residential and small commercial buildings. A program evaluation performed 18 months after the start of each program found that the customers participating in these programs would not otherwise have invested in energy-efficiency upgrades.

In 2007, Midwest Energy Inc. (a customer-owned utility) sought permission from the Kansas State Corporation Commission to operate a program resembling the two on-bill financing programs operating in New Hampshire. In its filing, the utility expressed its desire to reduce customer energy bills, and not just control rates.

In 2008, the Massachusetts State Legislature passed an energy bill that included provisions for the establishment of a pilot on-bill financing program.[53] Unlike the New Hampshire and Kansas examples, the motivation came from the State legislature and not the State utility commissions or individual utilities. The Massachusetts program will be administered by the State Energy Office in conjunction with public utilities. It specifically requires the payment to be structured so that the additions to the utility bill are less than the energy savings achieved, like the Energy Improvement Mortgages. It is tailored to smaller energy-efficiency purchases made by both businesses and residents.

The State of California requires utilities to reduce energy demand, and utilities have begun offering on-bill financing as one way to meet the requirement (Zwahlen, 2007).

3.2.3 Policy Rationale

On-bill financing provides a way for small businesses and homeowners to borrow money for the purchase of energy-efficient equipment. These groups often lack access to capital to insulate and weatherproof their buildings and to purchase high-efficiency equipment and appliances such as furnaces, water heaters, and heat pumps. Capital can be difficult to borrow, even though such improvements would save building owners money in the long term. Low-income customers often have special difficulties taking on debt, which makes on-bill financing especially applicable to these markets.

On-bill financing is a type of nontraditional financing mechanism that can overcome these barriers. With on-bill financing, the utility company loans money to businesses and/or homeowners to make such improvements; the loans are repaid (with or without interest) in installments applied to the monthly utility bill based on energy savings (rather than a traditional loan-repayment schedule); the balance transfers with building ownership. Nontraditional financing is needed because the loans are relatively small, and without the ability to aggregate loans into an overall program, the transaction costs would be too large to manage.

---

[53] http://www.mass.gov/legis/laws/seslaw08/sl080169.htm, section 84

Most performance contracting is directed at large or institutional customers; this is due, in large part, to State lead-by-example building improvement policies, as well as the relatively large savings and longer payback periods accepted by these customers (Goldman et al., 2005). Utilities experimented with performance contracting in the early 1980s as a means of financing home retrofits; however, the transaction costs were found to be high, and the energy services companies that conducted the retrofits for a share of the profit often invested in only a limited number of the most profitable upgrades, leaving significant opportunities behind (Brown and Reeves, 1986; Brown and White, 1988).

More than two decades later, designing a highly effective energy performance contracting program for residential and small commercial market seems highly feasible. Home Energy Rating Systems (HERS) have been matured, HERS training is available nationwide, and inspection protocols are available to verify that the recommended measures were installed. In a large portion of the residential market, energy-efficiency improvements can produce enough savings to completely pay for themselves with a short payback period, and there is enough experience with many types of retrofits to guarantee savings (HUD, 1992).

3.2.4 Stakeholders and Constituencies

By designing the program to deliver monthly energy bill savings that exceed the monthly financing costs for the energy-efficiency improvements, the participant benefits. The customers realize an economic benefit, and any future building owner would view the arrangement as a net benefit. Failure of a customer to repay the obligation could result in disconnection (just as failure to pay utility bills can cause services to be terminated). The utilities would benefit if their financial incentives are aligned with helping their customers use energy more efficiently. Regulatory reform may be required in States where utility profits are tied strictly to sales of electricity and/or natural gas.

3.2.5 Policy Evaluation

Appropriateness of the Federal Role. Most of these programs are administered by utility companies, often without assistance from a government source. However, there is plenty of room for the Federal government to encourage and assist utilities in offering on-bill financing. In the case of Massachusetts, the State provides funds to the utilities to cover the costs of the program. DOE could provide grants and funding to SEOs, which could in turn cover the costs of the program auditors and contractors. These costs would then be returned to the SEOs through the utility month bill repayments.

If the Federal government considers a National renewable and energy-efficiency portfolio (similar to those adopted recently in many States), then on-bill financing will likely be taken up by many more utilities. Supporting on-bill pilot programs now will give the Federal government and utilities a head start under such a scenario. Further, the use of a revolving loan fund mechanism would mean that the investments funded by the 2009 ARRA could be sustainable over many years. Such "sustainability" would mirror the success of the revolving loan funds established with Petroleum Violation Escrow accounts that provided for decades of energy-efficiency financing in many States.[54]

To enable the creation of revolving loan funds in States using ARRArevenues, DOE must deem the funds as being spent as the energy-efficiency upgrades occur. Such a deeming is necessary because of the limited timeframe the Bill places on the expenditure of funds.

Broad Applicability. Utilities, particularly those with a large customer base, can easily offer on-bill financing to their customers. Expanding services beyond the provision of gas or electricity to include energy-efficiency programs is a growing trend among utilities within the U.S. The use of DOE funds to enable on-bill financing is particularly important as a vehicle to allow municipal and rural cooperatives to participate, since they generally have less access to capital and would need more assistance in the initiation and design of such programs.

In the most general terms, such a financing program would be applicable to all existing dwellings and small businesses. Small businesses are those meeting the employee or receipts limits put forth by the Small Business Administration.[55] Defining "small commercial" will require some consideration on the part of the administrating party based on the specific characteristics of each State; qualifying characteristics could conceivably be based on average annual receipts, number of full-time-equivalent employees, average annual utility bills, or floorspace.

Metropolitan areas could play a special role in delivering these energy savings through on-bill financing: urban areas are natural "aggregators" for reaching large markets in a cost-effective manner by capitalizing on market size and compactness. Lower income households may also be particularly well suited to participation in on-bill financing programs.

Significant Potential Benefits. The United Illuminating Company and its subsidiaries have been operating an on-bill financing program for small businesses since 2000. Since then it has financed nearly 8,000 projects and estimates energy savings almost 200,000 MWh (worth $20 million @ 10¢/kWh). In addition to financing, the utility offers a complete assessment of energy needs, use, and cost-effective measures to reduce energy consumption (Gandhi et al., 2008).

---

[54] Petroleum Violation Escrow funds came from fines paid by oil companies in violation of the Federal oil price caps in place from 1973-1981. http://www.afdc.energy.gov/afdc/progs/view_ind_fed.cgi?afdc/321/0

[55] Small Business Size Regulations specifying size standards and governing their use are set forth in Title 13, Code of Federal Regulations, part 121 (13 CFR §121).

Spreading this type of program to utilities across the U.S. can result in tremendous energy savings, as demonstrated by the savings realized by the United Illuminating Company.

To estimate the potential benefits of on-bill financing programs, we assume that the annual participation rate is one percent of residences and small business floorspace, and the program begins in 2011, with new installations being financed for the following ten years, with the last of the energy savings occurring in 2030.[56] This participation rate is achievable, based on the past experience of utility demand-side management programs across the country. For instance, the Energy Smart Design program, implemented by Bonneville Power Authority (BPA) through Northwestern utilities, had participation of 3.7 percent of eligible floorspace in its beginning years (Xenergy, 1996).

For residences, 113 million homes in 2006 is forecast to grow to 141 million homes in 2030; excluding the 23 percent of homes that are considered "multi-family", about 105 million homes would be eligible to receive financing under this program (EIA, 2008a). Based on a meta-analysis of weatherization savings, electric-heated homes save 10.9 percent of pre-weatherization consumption and gas-heated homes save 21.9 percent of pre-weatherization consumption, with average annual site energy savings of 29.1 million Btu (Berry & Schweitzer, 2003). The weatherization program is targeted to low-income consumers who are also likely to live in older but smaller homes; thus, the savings and the retrofit costs could be higher or lower than in the general population. Based on the one percent assumption above, and a further assumption that each retrofit residence saved 29.1 MMBtu annually, annual incremental savings would range from about 27 trillion Btu in 2020 to 32 trillion Btu in 2030, excluding electricity related losses.

If average measure lifetime is assumed to be 10 years, cumulative annual savings would amount to about 280 trillion Btu in 2020 and 305 trillion Btu in 2030. Many of the most effective measures, such as insulation and better HVAC units have lifetimes longer than 10 years while some measures, like lighting, weatherstripping, and caulking have shorter lifetimes. Annual energy bill savings to residential participants could be between $316 million and $966 million (2006 $).[57] Cumulative annual bill savings in 2030 could be between $3.9 and $9.3 billion (2006 $).

---

[56] If there were no duplicity, 19 percent of single family and manufactured homes would be retrofit if 1 percent of the stock were retrofit each year from 2011 to 2030, based on stock estimates from *AEO 2008* (EIA, 2008a).

[57] Range given is low end of estimate in 2011 to high end of estimate in 2030. Low estimate based on AEO 2008 forecast of price for natural gas, and high estimate based on *AEO 2008* forecast of price for electricity; these two fuels offer the lowest and highest per mmbtu price in the EIA forecast (about $12 per MMBtu for natural gas and about $30 per MMBtu for electricity, although the actual price forecasts vary from year to year) (EIA, 2008a, Supplemental Table 20).

There was an estimated 77 billion square feet of commercial floorspace in 2006 that is estimated to grow to 104 billion square feet by 2030; this forecast demonstrates the importance of increasing the efficiency of existing buildings (EIA, 2009). In the quantification of benefits and costs in this report, small commercial benefits and costs are not defined; these are expected to be at least equal to those estimated here for residential dwellings.

Solutions not Dependent on Future R&D. The main goal of on-bill financing is to overcome market barriers related to the costs of purchasing energy-efficient retrofits including insulation and other building shell improvements as well as high-efficiency equipment and appliances. It is not dependent on future research and development. However, improvements in materials, equipment, and retrofit will have an effect on costs and savings, and reductions in the cost of completing HERS ratings would help program economics.

Cost Effectiveness. On-bill financing has proved cost-effective enough that some utilities, such as First Electric Cooperative, have chosen to offer it even without government requirements or assistance. Smaller utilities without access to enough capital cannot do this without assistance, however. A Federal program providing assistance to them could be administered for relatively little cost. For the consumer, the program makes it possible for them to purchase energy equipment that results in energy savings at least as great as the cost of the equipment (and frequently more).

States that have enacted legislation enabling institutional performance contracting designate which sorts of institutions (State and local government buildings, universities, or K-12 schools) can take advantage of this type of financing. They also define a maximum payback period and set program guidelines and training to ensure all building managers entering into performance contracts understand what performance contracting is and how it affects them (Goldman et al, 2005). However, Goldman et al. (2005) caution that enabling legislation alone does not make for a successful performance contracting market; rules and procedures developed within States as well as the availability of energy-efficiency investment funds from ratepayer fees (also called system/public benefits charges) contribute to success. Consistent and simple rules and guidelines can reduce transaction costs while additional sources of money reduce total project costs from the perspective of the participant.

Due to short paybacks, seed monies for financing could be designed as a revolving loan fund where the paybacks refill the coffers over time. For the purposes of a rough estimate, all retrofits are assumed to have a five year payback (and a 10 year effective lifetime), although actual paybacks and lifetimes will vary considerably. A five year payback based on the low and high energy prices in the *AEO 2008* forecast would support investment of $1,730 to $4,480, so an average of $3000 is used as the cost per home. Thus, an investment of about $3 billion per year is necessary and $15 billion in seed funds would be required to have funds available in the revolving loan pool.

Costs for this program would be to DOE, SEOs, and energy customers; DOE and SEO costs include seed funds, administrative costs, and absorption of defaults while participant costs include any transaction cost associated with applying for funding and lost time or inconvenience during the audit, retrofit, and inspection phases. Although the design of the program is such that savings should be greater than or equal to loan payments and payments would be part of a regular utility billing cycle, there are still apt to be defaults; this study assumes the default rate is one percent (or about $30 million, annually).

For participants, this policy is cost-effective with a total cost of $60.3 billion from 2011 to 2030 and savings of $52.6 (at lowest prices) to $135 billion (at highest prices); considering investments made from 2011 to 2021 and savings to 2030 (assuming a 10 year lifetime and a one percent discount rate), the net present value of the benefit to cost ratio of the program for participants is 0.99 to 2.57. The cost of borrowing money is excluded, but it will increase costs and decrease the benefit-to-cost ratio.

For illustration, consider a household or small business with an average monthly energy cost of $200. Assume that a home audit approves an investment of $2,000, which is estimated to cut the home's energy costs by 25 percent (i.e., saving $50 in energy costs). Assume that the $2,000 uses capital that is loaned at an eight percent rate of interest over a seven year amortization schedule, implying monthly payments of $32. Assume that there is a modest program administration cost of $3. The customer's utility bill could look like the following (based on Rogers, 2007):

Pre-participation monthly energy cost	$200
This month's energy savings	($50)
Your consumption this month	$150
Your energy efficiency repayment	$35
You owe this	$185

Funders need only set fees and interest rates higher than the default rate combined with inflation to realize a return. Such interest rates should be set to meet the required return on investment.

Administrative Practicability. The Federal government currently offers numerous funding assistance types of programs. It already administers the Low-Income Home Energy Assistance Program (LIHEAP) and Weatherization Assistance through State programs. These State administrators are well-connected to the utility providers and the energy needs of their communities and would be experienced and effective implementers of an on-bill financing program. In addition, the relationship between HERS raters and HUD offices for the distribution of EEMs offers an opportunity for effectively transferring remaining energy loan balances upon the sale of homes.

The development of funding and program guidelines should not create too large an administrative burden for the Federal government. Program guidelines for residential performance contracting have already been established by HUD in their program for Public and Indian Housing Authorities (HUD, 1992).

Administrative difficulty may arise in the beginning of the program as States or designated third parties work to establish procedures to effectively originate, monitor savings, and transfer loans. One point of difficulty for transfer of loans is the secondary market for equipment and appliances; contracts must be written in such a way to prevent the sale or transfer of equipment or appliances separately from the associated building until the loan and related fees have been completely repaid.

On-bill financing may also be difficult for some utilities to implement, given their current billing systems that may not be set up to have non-energy billing (Brown, M., 2009).

Additionality. This is a very specific policy addressing some of the market barriers to purchasing energy-efficient equipment. Other policies, such as Home Energy Rating Systems or mandated disclosure of energy use may also encourage the installation of more energy-efficient appliances and equipment, but only on-bill financing directly removes the upfront capital barrier. On-bill financing is also separate from weatherization programs, because assistance is being offered regardless of income and involves loans rather than direct government financial assistance for energy-efficiency upgrades.

It is important to note that this program is designed as a financing effort. Thus, savings attributable to this program may be counted by other programs that create awareness of energy consumption or savings potential. It will be difficult, in practice, to determine what energy and cost savings are directly attributable to this financing vehicle. Indeed, an effective communication outreach and marketing approach will be an important complement to enhance program effectiveness by achieving the levels of participation and economies of scale needed to produce program cost reductions.

At the same time, on-bill financing is particularly compatible with energy-efficiency performance standards, because the financing program offers a mechanism for meeting the EERS requirement.

3.2.6 Summary

On-bill financing appears to offer significant potential to engage residential consumers in increasing energy efficiency. As a result, DOE could consider promoting this policy option by offering financial assistance to State Energy Offices to establish revolving loan funds to enable on-bill utility financing of energy-efficiency improvements without up-front capital costs to the building owner. This policy would address the capital constraints that often prevent homeowners and small businesses entrepreneurs from upgrading the energy integrity of their buildings. Establishing on-bill financing programs based on government-financed revolving loan funds could result in large-scale energy savings and could extend the positive impact of the 2009 American Recovery and Reinvestment Act by many years.

4 Utility Policies and Regulations to Promote Energy-Efficient Buildings

While there are many barriers to the commercialization and deployment of clean energy technologies, those that are imposed by legislatures and regulators are particularly of interest as they operate at cross-purposes with the Federal government's commitment to GHG reductions. Government policies are designed to provide broad societal benefits that increase overall economic welfare, but they can inadvertently disfavor certain segments of the economy, including, in some cases, inhibiting the commercialization and deployment of energy-efficient technologies in buildings. When applied to the context of this report, these policies are referred to as "competing priorities" and are considered a barrier to deployment.

Many competing priorities result from policies established years ago for a public purpose that could be better addressed in other ways today. The utilities sector is replete with these. For example, electricity pricing policies set by State legislatures and regulatory commissions prevent markets from operating efficiently and create obstacles to low-carbon power choices. Ratemaking policies are supposed to ensure fair and efficient rates based on five, sometimes competing, goals:

- Capital attraction – making the regulated utility profitable enough to attract capital to maintain operations;
- Reasonably priced energy – ensuring rates are low enough that "everyone" can have access,
- Efficiency of production – ensuring rates are high enough that the utility can get a return on investment,
- Demand control – designing rates to avoid overconsumption, and
- Income transfer – designing rates that minimize the redistribution of wealth (Tomain and Cudahy, 2004).

Rates are traditionally set to reflect the average cost of maintaining a flow of electricity in a market designed to ensure capacity at peak. This means that the average rate will be slightly higher than the marginal cost of generation at all but peak periods. When the marginal cost of delivery is not equal to the marginal rate, consumers face inappropriate price signals. Not only do regulators resist rate increases for the utilities they regulate, legislatures repeatedly set artificially low price caps upon deregulation of the utilities. Rate regulation and downward pressure on rates is not isolated to electricity, but also occurs for natural gas (Hirst and Brown, 1990). Because they face lower average prices, consumers under invest in energy-efficient systems.

The real-time costs of electricity production can vary by a factor of ten within a single day. Because peaking plants are more expensive to run than baseload plants, retail electricity rates are higher during peak times than during shoulder and off-peak times under dynamic pricing structures, such as: time-of-use or critical peak pricing. Yet most customers in traditionally regulated markets buy electricity under time-invariant prices that are set months or years ahead of actual use; as a result current market structures actually block price signals from reaching consumers (Cowart, 2001, p. vii).

The use of traditional rules-of-thumb for allocating tax dollars and regulated revenues can also create conflicting priorities that impede energy-efficient technologies. Utility company profits, even in traditionally regulated electricity markets, are a function of electricity sales to customers. As a result, energy efficiency and rooftop solar photovoltaics can reduce utility profits, thereby discouraging utilities from promoting these clean energy options in residential buildings. Under current rate designs, companies that own transmission lines also benefit from electricity throughput, and find their profits reduced by energy-efficiency programs (Brown and Chandler 2008).

As another example, consider the universal ban on private electric wires crossing public streets, which was established originally to maintain safety on roadways by preventing the introduction of low-hanging wires. By forcing would-be power entrepreneurs to use their competitors' wires – often at a high cost – this ban penalizes local generation, which offers the potential for high-efficiency power delivery that could be particularly suitable for high-rise apartment complexes (Casten and Ayres, 2007).

Such competing priorities contribute to the slow market uptake of energy-efficient technologies and practices in the buildings industry. The following policy options would help address these barriers.

4.1 Performance Specifications for Smart Meters and Expanded Demand Response

Policy Option: Define performance specifications for "smart meters" that limit use of the label to devices with customer read-outs. Provide technical and financial assistance to States and utilities to provide for expanded demand response of residential electric loads through smart metering technologies and pricing schemes.

4.1.1 Synopsis of Policy Option

Enabling price responsive demand requires "smart meters," as an enabling device, in combination with time-dependent rates. The government could *define and limit the use of the term "smart meter" to only be applied to those meters which: 1) Record (electricity, natural gas, water) consumption hourly or more frequently, or on demand and 2) can interface with an in-home device or on-line tool.*[58] Such a definition is already being called for and could be formalized to avoid confusion. Texas's Public Utility Commission reported to the legislature that, "[t]he components of a robust and scalable AMI include standards-based open architecture to create a network of smart meters that are fully integrated with demand-response capability" (TPUC, 2008, p.5). In the United Kingdom, the Energy Retail Association offers that "Smart metering must facilitate: Complex tariffs; Customer information display; Export capability for Microgeneration" (ERA, 2008, p.3). Smart meters are referred to as those that both "listen" and "talk." Google has taken the back-end of this effort and supplied it as open-source.[59] Thus, utilities could provide information to consumers through Google's PowerMeter program, so long as the utility is receiving real-time consumption information.

In addition, Federal technical and financial assistance could help *develop dynamic and interactive metering practices* beyond utility pilot programs. Previous Federal efforts to offer somewhat varying prices demonstrated consistent consumer response via load shifting and energy savings, but the programs were not well known (Caves, Christensen, and Herriges, 1984). Fischer (2008) reviewed multiple consumption feedback studies and found that customers "approve feedback that is more detailed and more closely linked to consumption actions"; the most successful programs provided feedback through computerized (interactive) means, at least daily, and offered comparison to the users own historical consumption, rather than peers or average consumption. Dynamic and interactive feedback through in-home display meters or online consumption monitoring has been shown to drive both load management and energy savings (see reviews in Darby, 2006; Faruqui and Sergici, 2009).

Consumers will benefit from a *concurrent information program.* Information to consumers should increase understanding about how their energy is produced and delivered to them. Burr (2008) argues that consumers have been kept in the dark too long by the efforts of the government and utilities to ensure peak demand is met while keeping prices low and flat. Further, consumers may not trust utilities to provide them with technology and systems that actually help them, the consumers (Burr, 2008).

In addition, existing time variant pricing opt-in programs have low participation rates which drives utility regulators to conclude that consumers are not interested in smart metering or demand response programs (Radford, 2008; FERC, 2008). If participation will remain on an opt-in basis, financial assistance to eliminate or reduce opt-in fees, (for example if consumers have to pay for the meter or other technology) could increase participation.

---

[58] Water is not part of this policy discussion; however, water flows into a home, like energy, and can be measured with similar types of metering devices.

[59] http://www.google.org/powermeter/index.html

4.1.2 Policy Experience

Utilities have adopted advanced metering technologies already to reap the utility benefits of more detailed consumption information and reduced meter reading costs. However, more advanced meters with bidirectional communication and enabling rate policies, "smart meters" and advanced metering infrastructure (AMI) will be necessary to provide:

- more dynamic price information to consumers, [price responsive demand]
- alternative rate plans, [price responsive demand] and
- support load shedding programs [reliability responsive demand].

Of 6.1 GW potential peak residential load reduction nationwide, 5.5 GW is attributed to direct load control while pricing policies have had much smaller impacts (FERC, 2008, Table III-9). This is indicative of the state of current demand-side policies and not the future potential.

With time variant pricing and load management programs, like automatic operation, smart meters can drive more energy savings. More than 1.2 million residential customers (about one percent) were enrolled in some form of time variant rates in 2008 (FERC, 2008, Table III-5). Throughout this document, the term "time variant pricing" refers to any dynamic pricing scheme; these may be designed as peak and off-peak pricing, real time pricing, or critical peak pricing structures.[60] Research suggests that critical peak pricing is the most effective (Faruqui and Sergici, 2009). Figure 4.1 shows the average, minimum and maximum savings from pricing pilots using Time of Use (TOU), Peak Time Rebates (PTR) and Critical Peak Pricing (CPP) with and without enabling technology; enabling technology, like smart meters, are clearly helpful.

---

[60] These pricing structures are laid out in the Energy Policy Act of 2005,Title XII, Subtitle E, Section 1252

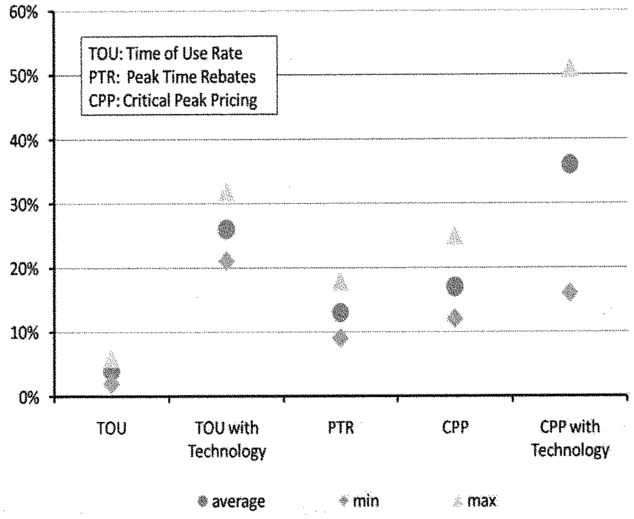


Figure 4.1 Summary of Pricing Pilot Savings
(Faruqui and Sergici, 2009 Table 31 p. 43)

The simplest form of time variant pricing is achieved by setting a higher "peak" rate and a lower "off-peak" rate; this does not exactly match the variability in the wholesale price, but it does provide a signal to customers that power is more expensive during peak periods, such as summer afternoons in most of the country. Rate design is an important part of success, and rates offered should be tailored to the region and customers. For example, New York's Con Edison offers a plan where customers opt-in to have lower "off-peak" rates; these customers have a higher base fee (at $18, it is $5 more than the base fee for regularly billed customers), but they can save money on their bills if they shed loads during peak periods (Belson, 2008). The program attracted only 2,500 of 2.7 million customers by July 2008, but mandatory time variant rates may be coming back for large customers – in 1992 they were put in place, but in 1997 they were no longer authorized.[61]

There are several pilots of various pricing schemes and display types ongoing across the United States. A large pilot program in Washington, DC, called Power Cents DC involves 1,200 customers over two years and is nearly halfway complete.[62] Results of this study should answer some questions about the longevity of consumer response to direct feedback – as it is still unknown whether consumers will "learn to ignore" the in-home display or smart meter device (Faruqui and Sergici, 2009).

---

[61] New York Public Service Law § 66(27)(a), as amended by Laws of 1997, Chapter 307

[62] http://www.powercentsdc.org/aboutpcents.aspx

4.1.3 Policy Rationale

For most consumable products, people would find it difficult to imagine consuming blindly first and paying later: groceries and gas come to mind. If not provided with enough information before and during the transaction, consumers could be shocked at the end of the month when they received their bill. Further, they would not likely know where they could reduce their expenditure. However, with energy used in the home, this is exactly how consumers are treated. With the cost of household electricity consumption just over $100 per month (and total residential energy consumption per household at $167 per month), most families have little incentive to better understand their energy bills by collecting more detailed metered data (DOE/EERE, 2008). Consumers face two related lack of information barriers that can be overcome by smart meters and time-variant pricing – they lack usable information about their consumption and they lack price signals related to the production of the energy they consume (Brown et al, 2008).

FERC (2008, p. ii) claims that barriers to success of smart meters and demand response programs include:

- few customers on time-based rates,
- little customer access to consumption data,
- difficulty measuring success (actual savings) of existing demand side management programs, and
- limited variety in demand side management offerings.

Further resolution on barriers to successful demand response programs for both customers and utilities was developed by the Brattle Group through interviews, but they can be summarized as lack of technology and lack of availability of dynamic pricing structures (Pfannenstiel and Faruqui, 2008).

4.1.4 Stakeholders and Constituencies

Utilities, State regulators, and manufacturers of related products will be vocal stakeholders. Utilities will want to ensure they can meet their returns to investment. State regulators will want to avoid harming consumers and ensure compliance with other State laws. Manufacturers will look for their chance to expand their business.

Consumers, especially those with low or fixed incomes are the most critical stakeholder in developing a dynamic pricing policy. There are concerns that the costs will be unfair and unbearable for low- or fixed-income consumers. Previous time variant pricing experiments have found this subpopulation to face a greater burden than the average consumer (Alexander, 2007). Alexander (2007) argues that low-income consumers are more likely to have an inelastic electricity demand; they may have inefficient appliances and live in uninsulated or leaky spaces, but they do not have the means – or always the authority, as the property may be owned by a landlord – to repair the situation. In California, "the elasticity of substitution for CARE customers is essentially zero" (Charles River Associates, 2005).[63] Thus, low-income consumers would be unable to shift load or shed load to avoid a jump in prices that might be associated with time variant rates.

Any policy that drives dynamic rates, reducing stability and increasing real rates, should consider ways to avoid harming the most vulnerable consumers. Policy options include exempting certain customers, such as those who require life-support systems, setting a threshold of consumption below which dynamic rates do not apply, having a set bill that covers the peaks and valleys in a customer's real bill, and developing a fund to support a transition period for consumers not prepared for an increase in rates.

Alexander (2007) raises the question of the appropriateness of spot-prices and wholesale prices of electricity as the correct signal as they are not the producer's marginal cost, rather they are set on wholesale demand. These spot prices, and other auction style pricing structure, can be manipulated or inflated by those who wish to increase prices (Tierney, 2008). Borenstein (2002) showed that the incentive to capture gains in this market is high, and manipulation is bound to happen, as it did in California in 2000. When policies are developed to allow for widespread time variant rates, they should consider protections from market manipulation.

Policy design should also consider how much of the market is allowed to participate; if customer participation remains low, the aggregate demand market will not respond to changes in supply (Sioshansi and Vojdani, 2001). A market without a participating demand side, such as the current electricity "market", is not a market and cannot be expected to operate efficiently (King, King, and Rosenzweig, 2007). Figure 4.2A shows demand responding to price in a "perfect" normal market; Figure 4.2B shows a market similar to that for electricity. Even with great increases in cost of supply, demand is unresponsive; although demand is not perfectly inelastic, the figure is representative.

---

[63] CARE: California Alternative Rates for Energy; qualified customers get a 20 percent discount on energy prices http://www.cpuc.ca.gov/PUC/energy/Low+Income/care.htm

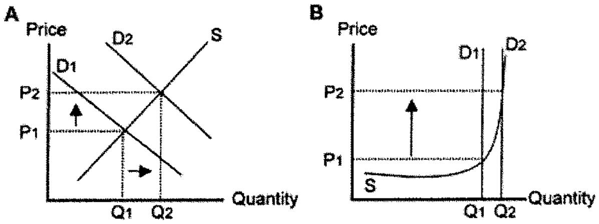


Figure 4.2 Supply and Demand Curves in (A) Normal Markets vs. (B) Capacity-Constrained Markets with Perfectly Inelastic Demand
(Sioshansi and Vojdani, 2001, Fig. 4)

4.1.5 Policy Evaluation

Appropriateness of the Federal Role. For creating a requirement to bear the label "smart meter," the Federal government has many precedents for labeling and use requirements. Previous meter standards, which were not created by the government, were developed to address the physical connection of the meters and the electronic meter reading interfaces (Levy Associates, 2002).

Through the Federal Electricity Regulatory Commission (FERC), the Federal government applies National standards to utilities, especially electricity. FERC is already actively working in smart metering, time of use rates, and demand response. In the 2008 update to FERC's annual Demand Response Report, the recommendations are:

> "(1) continue current coordination with NARUC on finding demand response solutions, with a focus on aligning retail demand response programs and time-based rates with wholesale market designs; (2) continue exploring how to remove barriers to the comparable treatment of demand response resources in wholesale markets; (3) coordinate the Commission's National Assessment of Demand Response and National Action Plan for Demand Response efforts required by Congress in the Energy Independence and Security Act of 2007 with the ongoing annual demand response reporting required by the Energy Policy Act of 2005 to ensure effective use of Commission resources; (4) support the efforts of organizations such as NERC, NAESB, and EIA to develop practical means to measure, verify, forecast, and track demand response; and (5) explore possible linkages among demand response, energy efficiency, and smart grid programs."

The 2009 update to the National Assessment of Demand Response, which will be prepared by FERC under statute, is supposed to have additional recommendations for achieving the nation's demand response potential.

Broad Applicability. Smart meters are applicable to all residential customers of electricity and piped fuels. Residents who get fuel delivered to tanks face a different sort of demand response pressure, and they are faced with filling the tank. This is a similar situation to many prepayment options that have shown energy savings.

However, some customers will be able to respond more than others. Special populations could see real increases in their bills, and should be carefully identified to prevent harm. Renters who do not see or pay their bill separately from their rent may not have an incentive to respond. Low-income or low-use consumers may not have any reductions to make. Homebound individuals especially those relying on "always on" equipment may be able to make reductions, especially involving comfort levels, but they could have health consequences.

Every building is metered; the main question is how well consumers will use the information and the extent to which it can change behavior. Research into feedback has shown that consumers will change their behavior with respect to energy consumption when provided with actionable information about their consumption and with economic motivation.

Significant Potential Benefits. Smart meters and their associated communication networks, also known as Advanced Metering Infrastructure (AMI) in the utility industry, have benefits outside of energy efficiency. These benefits can also be accomplished with a less "smart" technology, called an Automated Meter Reader (AMR), and include:

- reduced meter reading costs,
- improved meter reading accuracy,
- improved representation of outages and problems, and
- quicker move-out bills (Neenan and Hemphill, 2008).

However, these are only operational savings, and they accrue solely to the utility and ratepayers, insomuch as their cost of service may not increase as much as it would otherwise.

Societal savings are more difficult to quantify, but they include benefits from reducing market failures due mostly to flat, low rates that do not represent the true cost and time-dependence of electricity production and distribution. Neenan and Hemphill (2008) show that implementing demand response moves the efficiency frontier towards lower costs and lower risk; thus, smart metering with time variant rates and load management can drive such a move in the frontier.
The energy-efficiency benefits of smart meters depend on the degree of support from regulating bodies and State policy that utilities have to capture gains from a demand side management point of view.

It is important to consider benefits to all parties involved (utilities, taxpayers, participants, non-participants). Earle and Faruqui (2006) show that using bill savings as the measure of participant benefit does not reflect the differences in consumer gain and loss. Using a simplified model of a revenue-neutral two-period rate, consumer surplus was found to be half consumer bill savings under a variety of price elasticities and peak/off-peak consumption patterns (Earle & Faruqui, 2006). This finding is important because the spread of demand response relies on California's Standard Practice Manual which uses consumer bill savings in its cost benefit tests (GOPR, 2002).

According to Neenan and Hemphill (2008), public information from utility business cases show that of total benefits, those considered societal, range from 15 to 65 percent with an average of 34 percent; the balance is operational benefits. Figure 4.3 shows how several societal benefits of smart metering might be quantified.

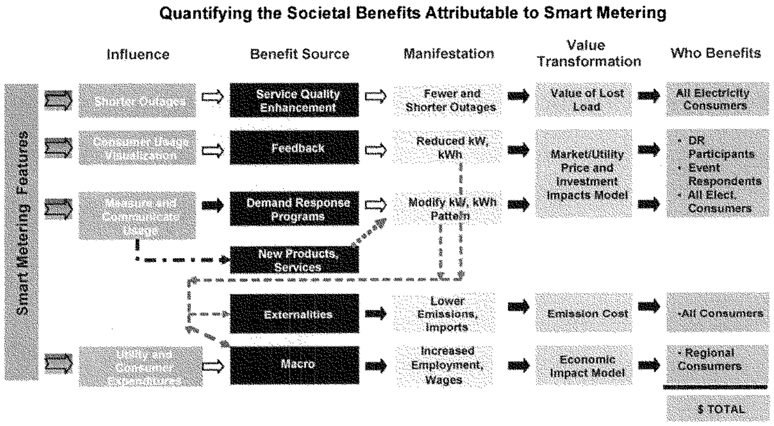


Figure 4.3 Example Flow Chart of How to Measure Societal Benefits
(Neenan & Hemphill, 2008, Fig.1 p.viii)

The potential for energy savings can be immense. Pfannenstiel and Faruqui (2008) estimate that technical potential for demand response is 25 percent of the peak while economic potential is 12 percent of the peak, and the current market achievable demand response potential is five percent. Of course, it is important to note that these estimates are for demand savings and not energy savings. While increasing demand response may have many benefits, it does not necessarily lead to significant KWh savings. Indeed, some demand techniques, like ice thermal storage, can actually use more energy.

Energy savings from smart meter technologies alone or in combination with alternative pricing have occurred both as load shifting and as real energy savings. The impact of these energy savings on carbon dioxide emissions is less clear and depends on the carbon intensity of the base-load versus peak-load power production. If a significant amount of energy is shifted from relatively on-peak low-carbon sources such as natural gas combined cycle power plants to base-load high-carbon sources such as pulverized coal plants, the carbon impact of load shifting could be unfavorable. Across the country, fuel sources for peaking plants vary, but they can be significant producers of carbon dioxide and criteria pollutants. In New York, peaking has been identified as an environmental justice issue. "New York's dirtiest power plants, which burn oil and tend to be located in poorer neighborhoods and operate just about 100 hours a year during the summer's hottest periods, account for a significant portion of the city's greenhouse gas emissions because they release three to five times more pollution than gas-fueled units" (New York DPS, 2008).

Darby (2006) found that direct feedback from meters or in home displays averaged energy savings of five percent to 15 percent over several studies. Prepayment in addition to smart metering has saved an average of 12.8 percent annually for Salt River Project's M-Power program customers – more than 50,000 residential customers participate in this prepayment program (King, 2007). Having consumption meters within the home in a user-friendly way led to average savings from 2.7 percent in British Columbia to 18 percent in Newfoundland and Labrador (CEATI International, Inc., 2008). An analysis of pilot programs showed savings of three percent to six percent using TOU rates alone with savings of 13 percent to 20 percent if they were designed as critical peak rates; in addition, the use of enabling technologies, such as in-home displays increased savings using critical peak rates to 27 percent to 44 percent (Faruqui and Sergici, 2009).

Faruqui et al. (2007) claim that reducing the peak demand by five percent could lead to nationwide savings of $31 billion with an updated figure by Faruqui and Sergici (2009) of $66 billion. Faruqui (2008) argues that reducing just the peak isn't enough and offers that reconsideration and reorganization of inclining block rates could lead to overall energy savings in addition to dynamic price or other smart meter savings. Pricing policies in combination with easy access to consumption information can be an effective combination; especially if the policies remain in place and apply to all customers. Sustained meaningful pricing structures are important because the long-run price elasticity is estimated to have a mean of -0.9, ranging from -0.7 to -1.4, while the mean estimate of short-run price elasticity is -0.3, ranging from -0.2 to -0.6 (EPRI, 2008).[64]

---

[64] Price elasticities are highly dependent on individual household, heating fuel, and regional characteristics (Bernstein and Griffin, 2005).

Solutions not Dependent on Future R&D. Effective smart meters have been developed and are already in place. 6.7 million smart meters were in place and being used in 2008, compared to just less than one million in place and being used in 2006; still more smart meters are installed and capable of being used (FERC, 2008). Still, 95 percent of meters are common technology – old-style meters (FERC, 2008).

Further R&D is ongoing and may bring costs of meters down and improve meter-human interaction and demand response; however, success of the program is not dependent on future research.

Examples of ongoing research include:

- Lawrence Berkeley National Laboratory is in the process of conducting a study to determine the most effective means of communicating more detailed consumption data to consumers.
- EPRI is working to develop a simplified method of accounting for all benefits and costs of smart meters.
- Similarly, FERC is researching the current practice and offering examples of demand response programs.

Cost Effectiveness. Faruqui and Sergici (2009) estimate that installing smart meters for the rest of the 95 percent of customers nationwide would cost about $40 billion. However, several utilities have made business cases for installing smart meters without consideration for the savings, especially during the most expensive peaks, possible through demand response. With advanced meters and required component communication devices costing between $78 and $181, estimated payback (differs by vendor, not only by price) ranges from 6.5 to 10.1 years without demand response (Levy Associates, 2005).

Thus, smart meters with dynamic pricing and automatic load control should more than pay for themselves. Figure 4.4 shows that the low end of benefit projections exceeds anticipated costs.

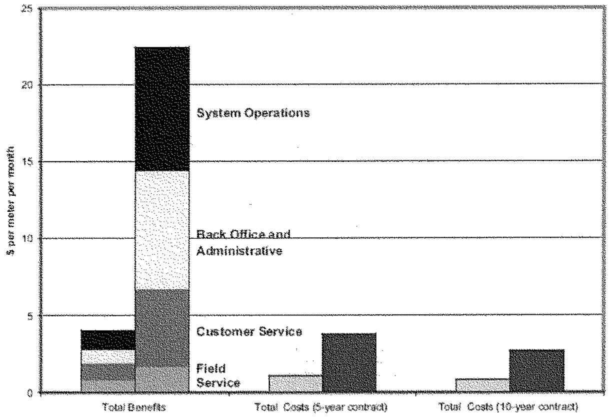


Figure 4.4 Comparison of Estimated Range of Benefits and Costs (Low on Left, High on Right) of Advanced Metering Systems
(Borenstein, Jaske, and Rosenfeld, 2002, Fig 2-a p.42)

Administrative Practicality. There are several ongoing avenues where administration of this program could be added with little or no change in administrative activity. Most fittingly, efforts to assist with development of smart meters, alternative or dynamic pricing, and automatic load control could be housed within existing smart grid efforts. For example, FERC is working with NARUC on the Smart Grid Collaborative; similarly, FERC is heading up efforts to define barriers and next steps in advancing the goals of the smart grid. DOE's Office of Electricity Delivery and Energy Reliability is working in the area of smart grid as well. While the Federal government cannot lobby State governments, they can provide the tools and analysis to aid PUC decisions.

At the State level, rolling out advance metering infrastructure and enabling time variant prices may require additional research and coordination efforts with utilities.

Additionality. Smart meters, together with time-of-use pricing and automatic load control, enable energy efficiency – especially by flattening peaks. Existing load management programs might offset some of the gains attributed to these meters and their associated load management policies. Policies to reduce total demand through energy efficiency may also interact with this policy; while savings will still accrue, they may not be completely additive.

4.1.6 Summary

It is recommended that the Federal government define performance specifications for "smart meters" that limit use of the label to devices with customer read-outs, and provide technical and financial assistance to States and utilities to provide for expanded demand response of residential electric loads through smart metering technologies and pricing schemes. These two actions are dependent upon each other for success as the meter enables a wider variety of pricing policies than are broadly available. Costs may increase for some consumers, but the benefits of reduced peak load and energy savings can outweigh these costs.

4.2 Alignment of Utility Financial Incentives with Customer Energy Efficiency

Policy Option: Ensure DOE's strict enforcement of the 2009 American Recovery and Reinvestment Act requiring that disbursement of funds to States be contingent on Governor assurances that financial incentives will be established for utilities that help customers use energy more efficiently. Also, expand the Federal Regulatory Assistance Program to help States design appropriate financial incentives for energy-efficiency programs.

4.2.1 Barriers Synopsis of Policy Option

Traditional rate-of-return utility regulations discourage utilities from investing in programs that help customers use energy more efficiently. Two regulatory approaches are seen by many to be effective solutions for overcoming these disincentives:

- "financial incentives" to provide shareholders with a fair return on investment for achieving energy-efficiency program objectives, and
- "decoupling" of utility revenues and profits through periodic and frequent true-up of projected sales and other mechanisms to provide utilities with timely cost recovery and earnings opportunities for operating energy-efficiency programs.

The 2009 American Recovery and Reinvestment Act emphasizes the need for these regulatory reforms by limiting the disbursement of energy funds to States that have eliminated these disincentives. Specifically:

> "Amounts appropriated under the heading "Department of Energy-Energy Programs-Energy Efficiency and Renewable Energy" in this title shall be available to the Secretary of Energy … only if the governor of the recipient State notifies the Secretary of Energy in writing that the governor has obtained necessary assurances that each of

> the following will occur: (1) The applicable State regulatory authority will seek to implement, in appropriate proceedings for each electric and gas utility, with respect to which the State regulatory authority has ratemaking authority, a general policy that ensures that utility financial incentives are aligned with helping their customers use energy more efficiently and that provide timely cost recovery and a timely earnings opportunity for utilities associated with cost-effective measurable and verifiable efficiency savings, in a way that sustains or enhances utility customers' incentives to use energy more efficiently."

It is recommended that DOE strictly enforce this requirement. In addition, Federal assistance is needed to help encourage State utility commissions to reform their ratemaking practices and to assist them in their assessment of the many design options. This could be achieved by expanding the Federal Regulatory Assistance Program.

4.2.2 Policy Experience

Decoupling and performance incentives are not new regulatory solutions – they were tried in many States during the 1980s and 1990s in the era of "integrated resource planning" (Eto, Stoft, and Belden, 1997). With utility restructuring and the movement to competitive electric markets beginning in the mid 1990s, many of these regulatory approaches to promote efficiency came to an end. With the increased focus on energy efficiency resulting from higher electricity prices and the growing concern for global climate change, there is a resurgence of interest in regulatory reform.

Despite this resurgence of interest, few States have enacted regulatory decoupling, and there is a limited experience base because of the newness of these efforts since they were first tried 20-30 years ago. California and Oregon are the primary leading examples of decoupling since the movement to restructure the industry.

- In California, decoupling mechanisms are in place for all electric and natural gas utilities.
- In Oregon, a decoupling mechanism is in place for its two natural gas utilities.

Other States have recently implemented pilot programs including Maryland, New Jersey, North Carolina, Utah, and Ohio (Kushler, York, and Witte, 2006). Several additional States are considering such an approach.

In contrast, other States have concluded that decoupling is not needed. In Georgia and Florida, for instance, rate true-ups are seen as frequent enough to eliminate the problem of revenue erosion when energy-efficiency investments cut sales (Florida Public Service Commission, 2008).[65] Kushler, York, and Witte (2006) note that several States with relatively large utility ratepayer-funded energy efficiency programs do not have either performance incentives or decoupling mechanisms in place.[66] Thus, other policy mechanisms and drivers are able to compensate for the absence of the two regulatory reforms described in this paper.

Under traditional rate-of-return regulation, utilities profits are based on the total amount of capital invested in selected asset categories (such as transmission lines and power plants) and the amount of electricity and natural gas sold. A utility's rates are set based on an estimation of costs of providing service over some period of time (including an allowed rate of return) divided by an assumed amount of electricity and/or natural gas sales over that period. If actual sales are less than projected, the utility will earn a smaller return on investment and in fact could fail to recover all of its fixed costs. Thus, financial incentives favor expanding energy sales and traditional utility-scale supply-side infrastructure.

Just as there are disincentives for end-use energy efficiency, there are also disincentives for distributed generation sold "off grid." Companies that own transmission lines also benefit from throughput and find their profits reduced by energy-efficiency programs. As Casten and Ayres (2007) explain: "Regulators approve rates that are supposed to provide a 'reasonable' return on invested capital. This encourages capital investment, regardless of efficiency. With approved rates in place, the utility's profits hinge on throughput – how much electricity flows through their wires. More sales, more profits. Actions that lead to conservation, appliance efficiency gains, and local generation all penalize utility profits."

The fundamental question is how to provide utilities with an appropriate incentive for helping customers save natural gas and electricity, not just for selling energy. Both decoupling and performance incentives are generally seen as part of the solution. Decoupling is a way to make sure all of the utility's fixed costs are covered, but on its own, it does not provide a reward for programs that are successful at saving electricity. Both California and Oregon have combined decoupling with an additional reward to be sure the utility has an adequate incentive for investing in energy-saving technologies. Such performance incentives can take several forms, three of which are currently being used in one or more States (Kushler, York, and Witte, 2006):

- Allowing utilities to earn a rate of return on energy-efficiency investments equal to supply-side and other capital investments (Wisconsin).

---

[65] Rate true-ups are rate adjustments that reflect changes in utility company avoided costs associated with increases or decreases in the sale of electricity and natural gas.

[66] States with significant electric energy-efficiency investments that have not reformed their electric regulations include Washington, Oregon, New Jersey, Iowa, Montana, and Wisconsin (Kushler, York, and Witte, 2006).

- Providing utilities with specific incentives or other financial rewards for meeting certain energy-efficiency program targets (Arizona, Connecticut, Massachusetts, New Hampshire, and Rhode Island).
- Allowing utilities to share the benefits of energy-efficiency programs in shared savings programs including on-bill financing programs (Minnesota).

4.2.3 Policy Rationale

In most States, utility regulations do not provide natural gas and electric utilities an economic incentive to operate programs that help their customers use energy more efficiently. In fact, traditional rate-of-return regulation typically results in disincentives for utilities to encourage their customers to be energy efficient because utility revenues and earnings shrink when utility sales decrease (Kushler, York, and Witte, 2006). It is becoming increasingly clear, that for utilities to embrace National goals of increased energy efficiency, utility regulations and policies need to be reformed (Leadership Group, 2006).

Fixing the problem of revenue erosion and decoupling profits from sales is critical to incentivizing the efficient use of electricity. Problems associated with utility ratemaking practices and their disincentives to energy efficiency were a major focus of the *National Action Plan for Energy Efficiency* (NAPEE). Developed by a Leadership Group composed of more than 50 leading organizations representing diverse stakeholder perspectives, the Action Plan was released on July 21, 2001. It focuses on these cost recovery problems, noting that regulatory policies governing utilities have more commonly compensated utilities for building power plants and selling energy, while discouraging energy efficiency even when saving energy costs less than generating energy. Ratemaking practices must be reformed for utilities to remain financially healthy while promoting the efficient use of energy by their ratepayers. Specifically, NAPEE recommends that stakeholders "Modify policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments (Leadership Group, 2006)."

4.2.4 Stakeholders and Constituencies

While the NAPEE Leadership Group included numerous utilities and utility organizations, many energy service providers have limited experience operating energy-efficiency programs for their consumers at the size and scope needed to transform the marketplace. Thus, utility industry resistance to the regulatory reforms proposed here exists in many regions of the country. On the other hand, there is increased recognition that the nation's growing demand for energy and increasing carbon emissions cannot be addressed without effectively tackling consumer end-use issues. Green and energy-efficient product vendors are becoming a more vocal force for government interventions, such as utility regulatory reforms, that expand the use of energy-efficient equipment, appliances, and building practices.

4.2.5 Policy Evaluation

Appropriateness of the Federal Role The initiative proposed here is modeled after the Buildings Code Assistance Program (BCAP) operated by the Alliance to Save Energy, a non-profit organization, for the U.S. Department of Energy's Building Technology Program. In this case, the initiative would support the activities of an existing but under-funded non-profit organization. The Regulatory Assistance Project (RAP), which was formed in 1992 by experienced utility regulators, provides research, analysis, and educational assistance to public officials on electric utility regulation.[67] RAP workshops cover a wide range of topics including electric utility restructuring, power sector reform, renewable resource development, the development of efficient markets, performance-based regulation, demand-side management, and green pricing. RAP also provides regulators with technical assistance, training, and policy research and development. RAP has worked with public utility regulators and energy officials in 45 States and Washington, DC.

Broad Applicability. The sphere of influence of this policy mechanism could be quite broad, promoting energy efficiency in the residential and commercial buildings industry – both new and existing housing – and in industry, as well. In addition, decoupling is applicable to both natural gas and electric utilities. Currently decoupling legislation has been passed by 16 States for natural gas utilities and in six States for electric utilities.

Significant Potential Benefits. The NAPEE Leadership Group concluded that more than half of expected growth in demand for electricity and natural gas could be avoided over the next 15 years by extending energy efficiency "best practice" programs to the entire country, in conjunction with regulatory reform. They estimate that such an effort would save nearly $20 billion annually on energy bills, avoid 60 new 500 MW power plants, and reduce CO_2 emissions annually by more than 400 million tons (Leadership Group, 2006).

Kushler, York, and Witte (2006) observe that five of the States with the largest portfolios of electricity efficiency spending as a percentage of total utility revenue in 2006 had either decoupling in place (i.e., California) or had performance incentives (i.e., Vermont, Massachusetts, Rhode Island, and New Hampshire). While the causality is not definitive, this finding suggests that these regulatory reforms are indeed powerful enablers and motivators of utility investment in energy efficiency.

---

[67] http://www.raponline.org/

Since only 14 States have enacted decoupling in natural gas markets and only six in electricity markets, these findings underscore that regulatory reform of energy industries is only beginning in the U.S. Decoupling combined with performance incentives could transform utilities "from sellers of a least-cost energy commodity to providers of least-cost energy services" (Eto, Stoft, and Belden, 1997, p. 54).

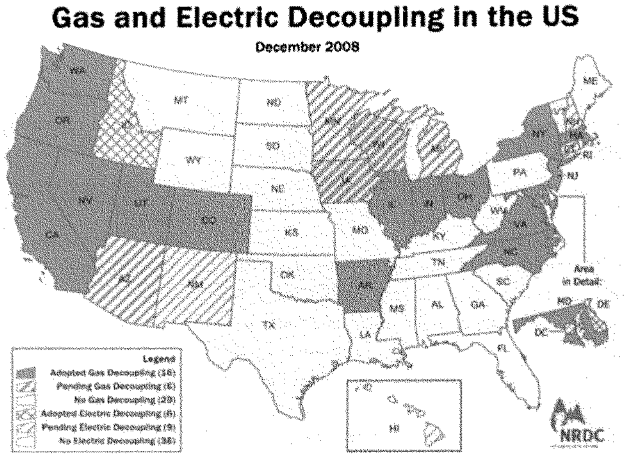

Gas and Electric Decoupling in the US
December 2008
WA
OR
CA
NV
ID
MT
WY
UT
CO
AZ
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MI
IN
OH
KY
TN
MS
AL
GA
FL
SC
NC
VA
WV
PA
NY
NJ
ME
MA
CT
RI
Area in Detail:
MD
DE
DC
HI
Legend
Adopted Gas Decoupling (16)
Pending Gas Decoupling (6)
No Gas Decoupling (29)
Adopted Electric Decoupling (6)
Pending Electric Decoupling (9)
No Electric Decoupling (36)
NRDC

Figure 4.5 Status of Decoupling Requirements Across States in 2008
(Source: NRDC,
http://switchboard.nrdc.org/blogs/bcolander/decoupling_and_energy_efficien.html)

Solutions not Dependent on Future R&D. Strict enforcement by DOE of the requirement that utility financial incentives align with customer energy efficiency could begin immediately. It does not rely on the successful completion of additional R&D or the development of future technologies.

Cost Effectiveness. Duke Energy's recently announced "save-a-watt" initiative illustrates the type of promising new direction needed for utilities to promote energy efficiency.[68] The initiative has been incorporated into the energy-efficiency plans filed over the last two years by Duke Energy in North Carolina, South Carolina, and Indiana. It entails the pursuit of all cost-effective energy efficiency savings with no company-imposed cap on its total energy-efficiency investment. The initiative's target calls for reducing electricity use by one percent or more each year, subject to the availability of cost-effective energy-efficiency programs to achieve the target.

---

[68] http://www.duke-energy.com/news/releases/2007050701.asp

Administrative Practicability. To be successful, regulators in each State need to determine an appropriate and reasonable level of compensation to reward utility investments in customer energy efficiency. This is where an expanded Federal Regulatory Assistance Program (RAP) could be critical to unleashing these market forces for energy efficiency in metropolitan areas. RAP is a non-profit organization, formed in 1992 by experienced utility regulators, that provides research, analysis, and educational assistance to public officials on electric utility regulation. While an expanded RAP could help utilities reform their reward systems for energy efficiency, the ability of RAP to convince PUCs to change their ratemaking practices is somewhat uncertain.

Additionality. Many other approaches can promote energy efficiency, but reforming utility rate-of-return regulation is seen by many to be a lynchpin.

4.2.6 Summary

DOE could strictly enforce the 2009 American Recovery and Reinvestment Act's requirements that utility financial incentives are aligned with helping their customer use energy more efficiently. It could also expand its technical assistance to help States design appropriate financial incentives for energy-efficiency programs. These Federal actions could reposition utilities as powerful enablers of a more efficient end-use energy infrastructure.

4.3 National Energy Efficiency Resource Standard (EERS)

Policy Option: Promulgate rules such that electric and natural gas distributors are required to meet an energy efficiency resource standard (EERS); concurrently establish a national market for trading energy savings credits.

4.3.1 Synopsis of Policy Option

The Federal government could *establish a National Energy Efficiency Resource Standard that would require utilities to reduce electricity demand by at least 15 percent and natural gas demand by at least 10 percent by 2020.* These goals are included in both House and Senate versions (H.R. 889 and S. 548) of the Save American Energy Act, introduced by Rep. Edward Markey (D-MA) and Sen. Charles E. Schumer (D-NY), and in Section 231 of the Waxman-Markey Discussion Draft – The American Clean Energy and Security Act of 2009. EERS requires electric and natural gas distributors to meet customer needs in part through energy efficiency and load reduction programs thereby reducing greenhouse gas emissions and offsetting or postponing the construction of new power plants.

The Federal government could *issue regulations on eligible measures accompanied by measurement and verification (M&V) methods.* Enforcement could be at the Federal or State level. M&V requirements should be clearly defined and present a reasonable burden so that the benefits of cost-effective energy efficiency projects outweigh the time and expense of M&V. Robust M&V is essential to maintain a credible, transparent, and viable market trading system in which all parties have confidence. In addition, if parties agree to M&V methods, non-compliance can be dealt with swiftly rather than spending time in litigation over M&V methods.

The EERS policy would benefit from being accompanied by a National *market for trading energy savings*. Such a market could be used to trade or bank energy savings between utilities across the nation. With a confident market – produced by reliable measurement and verification, energy savings can be traded to achieve savings at the least cost.

4.3.2 Policy Experience

Twenty-eight States currently have some form of EERS - either as a requirement or goal, with 18 including efficiency as a source for a Renewable Portfolio Standard (RPS). Figure 4.6 shows variation in State EERS adoptions and policy support for electric energy efficiency.

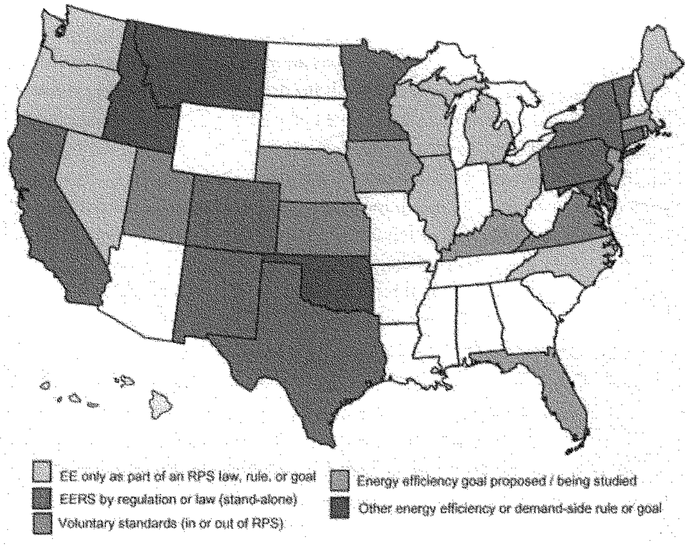

EE only as part of an RPS law, rule, or goal
EERS by regulation or law (stand-alone)
Voluntary standards (in or out of RPS)
Energy efficiency goal proposed / being studied
Other energy efficiency or demand-side rule or goal

Figure 4.6 Energy Efficiency Resource Standards in the States
(Source: http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-eeps.pdf, last updated March 10, 2009)

While there are many similarities between EERS and RPS, the distinction between them is that the former requires a level of energy *demand reduction through efficiency improvements,* whereas the latter requires a level of renewable energy *supply.* In some States, energy efficiency is listed as an acceptable "source" of renewable energy supply for an RPS (Harmin, Vine, and Sharick, 2007). This extension of the RPS rules reflects the growing recognition of energy efficiency as a "resource" – on par with raw energy supplies – that can lower energy demand and provide economic and environmental benefits including the reduction of greenhouse gases and preservation of water quality.

Considering a few State case studies is helpful for evaluating the impacts at a National level (ACEEE, 2009).

- In 1999, **Texas** required utilities to offset 10 percent of load growth through end-use energy efficiency. After meeting this goal at low costs, the legislature increased the standard to 15 percent of load growth by 2009, 20 percent of load growth by 2010 and directed that higher targets be investigated. A recent report commissioned by the Public Utility Commission of Texas found that raising the goal to 50 percent of load growth is feasible.
- Efficiency **Vermont** (EV), created in 2000 as an independent "efficiency utility," delivers efficiency programs for the State. It is contractually required to achieve energy savings and demand reduction goals. By the end of 2007, EV had cumulatively met over seven percent of Vermont's electricity requirements, completely offsetting electric load growth (Furrey, Nadel and Laitner, 2009). New goals for 2009-2011 call for saving about two percent per year. In 2007, EV improved its productivity by streamlining and simplifying their processes, allowing them to reach more customers and making it easier for their customers to take advantage of savings opportunities. The number of participating businesses (those that replaced equipment or upgraded their processes) continued to grow, with 63 businesses added in 2007, a 10 percent increase from 2006.
- **California** set energy savings goals for investor-owned utilities for 2004-2013 and expected to save more than one percent of total forecast electricity sales per year. In the early years, savings were less than one percent per year, but in 2007, measures installed that year met 1.5 percent of the State's electricity needs. In July 2008, the California PUC established new targets for energy savings for the years 2012 through 2020 for its regulated utilities. The new goals are expected to provide approximately five percent energy savings over that period.
- Under **Hawaii's** Renewable Portfolio Standard (RPS) requirements (in place since 2004), energy efficiency qualifies as an eligible resource. Utilities must meet 20 percent of electricity sales with eligible resources by 2020, with no limit on how much may be met

by energy efficiency. In recent years, Hawaii has been achieving between 0.4 – 0.6 percent energy savings per year through energy efficiency.

- In June 2005, the **Connecticut** legislature modified its RPS to include efficiency. Starting in 2007, the State's utilities must procure a minimum one percent of electricity sales from "Class III" resources such as energy efficiency and combined heating and power, with an additional one percent required in 2008, 2009, and 2010. Savings in 2007 were 1.04 percent of sales.
- In 2005, **Nevada** expanded its existing RPS from 15 percent to 20 percent of electricity sales by 2015, and was amended to allow energy efficiency to meet up to 25 percent of the total portfolio standard. The State's utilities are quickly ramping up efficiency programs to hit the maximum allowed efficiency threshold (Furrey, Nadel and Laitner, 2009).
- The **New York** Public Service Commission (PSC) adopted a RPS in September 2004 and issued implementation rules in April 2005.[69] On May 16, 2007, the Public Service Commission initiated a proceeding to design an electric and natural gas EERS.[70] In June 2008, the New York State Public Service Commission approved the Energy Efficiency Portfolio Standard (EEPS), which sets a goal to reduce electricity usage 15 percent by 2015, a goal initially announced by Governor Spitzer in 2007. The Commission currently has an open proceeding working with utilities and the New York State Energy Research and Development Authority (NYSERDA) to expand existing programs and develop new ones (Furrey, Nadel and Laitner, 2009).
- On August 28, 2007, the governor of **Illinois** signed Senate Bill 1592 into law which includes an EERS and a RPS that will require Illinois utilities to reduce overall electric usage by 0.2 percent of demand in 2008, escalating to two percent by 2015. The RPS requires utilities to supply two percent of their power from renewable energy sources by 2008 for certain "eligible customers", escalating to 25 percent by 2025.[71] Utilities such as ComEd and Ameren Illinois Utilities have developed innovative programs such as Smart Ideas Incentive Program[72] and the ActOnEnergy™ programs[73] to meet the goals of the EERS.

California, Connecticut, Hawaii, Nevada, Texas and Vermont have had the most experience with implementation of an EERS and, as such, are considered some of the most successful States in operating energy-efficiency programs. All of these States have consistently increased their annual energy savings goals over time and have been achieving or are on track to achieving their stated energy savings goals.

---

[69] New York Incentives for Renewable Energy: .http://www.dps.state.ny.us/03e0188.htm
[70] Energy Efficiency Portfolio Standard: Case 07-M-0548: http://www.dps.state.ny.us/Case_07-M-0548.htm
[71] Illinois Energy Efficiency Portfolio Standard (EEPS): http://smartenergy.arch.uiuc.edu/html/EEPS.html
[72] ComEd Smart Ideas Programs: http://www.comed.com/search?Find=Smart%20Ideas%20Program
[73] Ameren Illinois Utilities ActONEnergy™ Business Program Enjoying Immediate Success: http://money.aol.com/news/articles/qp/pr/_a/ameren-illinois-utilities-actonenergytm/rfid137796170

The nineteen States that are implementing an EERS are positioned to achieve a little over five percent electricity savings by 2020 (Furrey, Nadel and Laitner, 2009). These States are, therefore, on track to achieve about one-third of the national goal of 15 percent electricity savings by 2020. A more concerted effort is required in these States and in the remaining 31 States and the District of Columbia if the full 15 percent reduction is to be met by energy efficiency.

There is considerable international experience as well; EERS programs have been working well in the United Kingdom and the Flemish region of Belgium. Italy has recently started a program, and another is about to start in France.

In addition to experience with EERS policies, there is some recent experience with trading energy savings. Trading energy savings via Energy Savings Certificates (ESC), Tradable White Certificates (TWC), or White Tags™[74] fits well within the EERS program by allowing crediting, banking, or trade of savings to keep aggregate costs low (WRI, 2008). In 2003, New South Wales adopted a trading scheme for energy savings (Friedman, Bird, and Barbose, 2008). Since then, Italy, France, and the United Kingdom, along with four States, have developed systems for trading energy savings certificates. Among the four States – Connecticut, Pennsylvania, Nevada, and Michigan – only Connecticut has a working program while the other three allow trading to meet requirements (Friedman, Bird, and Barbose, 2008). The European Union is considering developing a European market for trading energy savings.[75]

A voluntary National market for energy savings certificates could develop, like the market for Renewable Energy Credits (RECs), but it is not clear when this would happen under current policies; similarly, energy savings certificates might be used to comply with carbon restrictions, like in the Regional Greenhouse Gas Initiative (Friedman, Bird, and Barbose, 2008). After reviewing existing ESC programs, Vine and Hamrin (2008) offer the following elements of an effective energy savings trading program:

- Transparent rules and procedures throughout development
- Little or no proprietary information withheld from the public
- A flexible measurement and evaluation system that ensures real, measurable, verifiable, and additional energy savings

---

[74] Any of these names can be considered "an instrument representing a unit of energy savings that has been measured and verified" (Friedman, Bird, and Barbose, 2008)

[75] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC (accessed from http://eur-lex.europa.eu)

- Independent third-party auditing for verification and compliance
- A process for issuing and tracking certificates that avoids double counting (responsible parties should be identified a priori)
- A system for detecting and penalizing non-compliance

Some of the effort to create measurement and verification as well as tracking certificates may be reduced by private efforts already undertaken. For example, the North American Renewables Registry claims to be prepared to meet the need for energy efficiency trading markets, "APX is closely following the development of energy-efficiency standards and State programs and is prepared to provide a market infrastructure solution to ensure trust and transparency for these new environmental commodities".[76]

4.3.3 Policy Rationale

On the one hand, State policies such as EERS foster diversity, which encourages innovation and experimentation. Decentralized environmental decision-making, in general, provides for inter-jurisdictional competition and creates "laboratories of democracy," a metaphor coined by Justice Brandeis in 1932. It encourages adaptation to local circumstances and needs, creating "ecologies of scale" that can maximize social welfare and minimize cost. State and local policies tend to be more representative, creating regulations and public services that better match local interests and preferences, in contrast to Federally imposed uniformity (Sovacool and Brown, 2009).

On the other hand, a National EERS could reduce the regulatory confusion and administrative burdens that have resulted from the patchwork of State-regulated EERS. A Federal EERS mandate would produce a standardized regulatory environment that would provide manufacturers and industry with consistent and predictable business rules that are important when attempting to create national markets for green technologies. In contrast, a multiplicity of State standards increases transaction costs, causes confusion in the marketplace, and prevents economies of scale. State EERS in lieu of a Federal policy also send distorted price signals. By lowering demand for energy-intensive products, State standards can reduce the regional (and even global) price for carbon-intensive fuels. Reduced prices, in turn, decrease the incentive to enact energy efficiency and conservation measures.

A patchwork of State policies allows stakeholders to manipulate the existing market to their advantage, using regulatory loopholes to waste energy and emit greenhouse gases wherever regulators are the most lax. A National EERS with standardized M&V guidelines would likely be less costly to operate than having a variety of State-defined M&V approaches. In addition, a nationwide policy could provide greater economic efficiency by allowing utilities to trade energy savings credits across the country.

---

[76] http://narenewables.apx.com/about/FAQ.asp

4.3.4 Stakeholder and Constituencies

Important stakeholders include the States – particularly regulating bodies, electric utilities, natural gas utilities, and energy services companies. Support or objection from these groups is likely to depend on the aggressiveness of targets set in the EERS and the ease of trading energy savings certificates in the national market.

Consumer groups represent the interests of citizens, but from different perspectives. A National EERS with a trading mechanism may be attacked on environmental justice grounds – if energy savings accrue in some areas while others face new plant construction. Without a trading mechanism, a National EERS may be attacked on economic grounds as some utilities, and some regions, can support efficiency programs at lower costs than others.

One equity issue that may create opposition to a National EERS is "credit for early action." Current drafts of National EERS legislation do not provide credit to States that have already enacted EERS policies or other energy efficiency initiatives. Instead, States are required to realize annual savings based on averages of the previous two years' sales relative to business-as-usual (BAU) projections; this benchmark will change every year and will include efficiency gains from previous years. Credit for early action could be awarded by allowing pre-existing EERS policies to be considered as part of the BAU. The resolution of this additionality issue will either favor or penalize States that have taken early action to promote energy efficiency.

Research has shown that Federal funding can crowd-out State funding of projects (Knight, 2002). Design of any incentive program to support EERS will need to take this phenomenon into account. Arguments against incentive programs may also call such funding "coercion". Incentive policies seem less benign when viewed as a form of power rather than a form of trade; purpose and impact on character of parties involved should be considered alongside the degree of voluntariness in the action of receiving an incentive (Grant, 2006). It may be just as effective for the Federal government to make clear statements of its preferences for State policy action regarding energy efficiency (Allen, Pettus, and Haider-Markel, 2004).

Federal funds might also be saved by allowing States greater flexibility in designing EERS programs, as governors have shown willingness to accept less grant funding for fewer restrictions (Volden, 2007). The cost structure of a Federal mandated program could be based on customary practices in the States that are leading in EEPS programs. Typically, the customer pays two-thirds of the cost; utilities pay one-third of the cost of investment in efficiency measures. It is estimated that by 2020, under the proposed National EERS, customers will have invested approximately $78.5 billion in energy efficiency measures. This level of investment will yield almost $170 billion in net benefits as a result of energy efficiency measures installed in

2020. "Net benefits" are the total savings gained from energy-efficiency measures minus the program costs and investments associated with the measures. These benefits have been estimated to average about $1,280 in savings per household from efficiency measures installed by 2020 (Furrey, Nadel and Laitner, 2009).

4.3.5 Policy Evaluation

Appropriateness of the Federal Role. The Energy Policy Act of 2005 did not include either an EERS or a Public Benefit Fund (PBF) although it did include provisions for a DOE study and authorization of State pilot projects to stimulate utility and State electricity and natural gas efficiency programs. PBFs play a complementary role by creating funding that can be used to support efficiency programs, but they are not essential for EERS to be successful. Because PBFs are generally designed as a surcharge on per unit pricing, they act as a fee.

Other examples of Federal involvement in reducing energy use, mitigating emissions, and improving energy efficiency are embodied in the Energy Independence and Security Act (EISA) of 2007. Signed into law on December 19, 2007, requires (a) use of 36 billion gallons of ethanol by 2022; (b) creates a minimum Corporate Aggregate Fuel efficiency (CAFE) standard of 35 mpg by 2020 for cars and trucks; (c) creates various appliance efficiency standards; (d) establishes a lighting efficiency standard started in 2012; (e) requires industrial electric motors to meet the premium motor efficiency standards of the National Electrical Manufacturers Association (NEMA); and (f) creates or enhances a number of other programs related to industrial waste heat or natural gas efficiency, energy use in Federal buildings, weatherization assistance, and manufactured housing (EIA, 2008a, p. 15).

Federal incentives to drive State policy are commonplace. For example, Federal grants fund highway projects in States, so long as States maintain speed limits and other laws; Federal grants for education require States to implement and report certain minimal testing requirements.

Alternatives to EERS are a valid policy consideration. Two alternatives are: 1) alternative policies to reduce consumption, or 2) alternative policies to reduce emissions.

EERS set a target, goal, or requirement for efficiency to meet compared to forecast consumption. Other policies designed to drive efficiency could be used to meet this target, goal, or requirement. Alternative policies to reduce consumption include: fiscal policies, market transformation policies, and demand-side management policies.

- *Fiscal policies* provide tax credits, tax rebates, grants, or loans to improve efficiency in a process, application, or building. These are subject to free-riding, a market externality that harms economic efficiency.

- *Market transformation policies* fundamentally change the way that energy is considered in the market. These take more work to fully develop. We have little policy experience with them because of their transformational nature. Two possible examples are provided. 1) Decreasing information asymmetry by requiring greater information about home or building energy consumption or performance before sale or lease. 2) Aligning utility incentives with energy efficiency by decoupling profits from sales.
- *Demand-side management policies*: work at reducing consumer demand at peak periods throughout the day and seasons. These are usually operated by utilities, which have acquired a great deal of experience with them. EIA (2008e, Table 8.13) estimates that estimate that electric utility DSM programs in 2006 were responsible for 11 GW of actual peakload reductions. Smart metering with dynamic pricing, such as critical peak pricing, has reduced peak consumption in pilot programs by up to 20 to 50 percent (Faruqui and Sergici, 2009). Pricing policies not based on peaks, such as increasing block prices, could also reduce consumption. Sustained meaningful pricing structures are important because the long-run price elasticity is estimated to have a mean of -0.9, ranging from -0.7 to -1.4, while the mean estimate of short-run price elasticity is -0.3, ranging from -0.2 to -0.6 (EPRI, 2008).

Sufficient attention should also be paid to improve EERS policy implementation. While there is not enough policy experience to determine main drivers of success or failure of the policy, there should be sufficient information about initial hurdles or methods of implementation. A better appreciation of the distribution of the burden for EERS should be developed to indicate how this burden may change over time or could there be other policy options that could accomplish the goals more effectively.

Broad Applicability. EERS are generally applied only to large investor-owned electric utilities. However, perverse incentives could be avoided by applying them to any electricity or natural gas retailer. If the intention is to expand EERS to other fuels the same concept would apply. Successful EERS is also contingent on decoupling of profits from sales.

EERS allows states the flexibility to establish their own business models that maximize energy savings. EERS is not a prescriptive methodology, but would require a new business model that deviates from the existing practice of feeding demand by constructing new plants. Other barriers that EERS overcomes is the "tenant/landlord" split incentives, marginally higher upfront costs of efficient products with disregard for long term benefits of energy and environmental stewardship.

Significant Potential Benefits. EERS can be a driver for employment, manufacturing, and environmental quality. A National EERS (at 15 percent electric and 10 percent natural gas by 2020) could save enough energy to "power almost 48 million households in 2020, accounting for about 36 percent of the households in the United States. Moreover, this level of energy savings will save Americans almost $170 billion, create over 220,000 jobs and reduce greenhouse gas pollution by 262 million metric tons while eliminating the need to build 390 power plants" (Furrey, Nadel, and Laitner, 2009).

Consumers will benefit from reduced costs if efficiency is cheaper to supply than other sources and the savings are passed through to them. For residential consumers, lighting and behavioral-use changes for HVAC could potentially yield benefits almost immediately, especially for public benefit funded projects, which are "pre-paid," and projects paid for with on-bill financing. Other measures, such as building renovations and the installation of networked meters, may take longer. Many of the benefits, such as energy security and climate change mitigation will accrue to society as a whole and will not necessarily have a direct monetary/cost-benefit effect on consumers.

ACEEE estimated a benefit-to-cost ratio of 2.6 for a National EERS of 0.75 percent per year (after a two year ramp-up period) over the period 2007-2020 (Nadel, 2006a). Although efficiency has been shown to have levelized costs equal or less than that of other supply options, new programs are often developed, with associated costs, to implement efficiency efforts. There is not enough State experience with EERS to be sure of consumer benefits or costs, or to understand the distribution of the costs and benefits in terms of who gains, who loses, and how this changes over time. In addition, previous national studies of efficiency potential for the U.S. show that goals of the current EERS under discussion (15 percent electricity and 10 percent natural gas by 2020) are not likely to occur unless under a very aggressive policy scenario such as a Federal EERS; see Table 4.1.

Climate change benefits depend on the supply option (emitting or non-emitting) that are offset by the EERS. Policies like EERS can reduce the carbon intensity of the energy supply which could reduce the carbon intensity of the economy in general. In 2007, converting fuels to electricity emitted 2,400 $MMTCO_2e$ of 7,300 $MMTCO_2e$ for the economy (EIA, 2008d). A reduction in forecast emissions from the electric power sector in 2020 by 15 percent [assuming that the EERS target is met by avoiding carbon based electricity generation] amounts to a reduction of 374 $MMTCO_2e$ (EIA, 2009). Similarly, a reduction in forecast emissions from natural gas direct fire in 2020 by 10 percent amounts to a reduction of about 91 $MMTCO_2e$ (EIA, 2009). The total estimate, about 465 $MMTCO_2e$ represents seven percent of forecast energy-related emissions in 2020.

Some utilities may be concerned that state or Federal mandates on energy efficiency may create a false impression that there is no need to build new supply-side generation. Another concern is that an overly simplistic and inadequately funded M&V system may not accurately capture the impact of energy efficiency programs. M&V should have a high degree of transparency and statistical rigor to ensure that efficiency measures are properly accounted for during economic excursion events (boom or bust cycles). Notwithstanding the variances in estimating the effect of consumer behavioral factors on energy consumption, M&V methodology should include guidelines for states to baseline their energy use, estimate peak energy demand reduction and develop the metrics for deemed savings. Issues related to M&V have been adequately and successfully addressed by the International Performance Measurement & Verification Protocol (IPMVP) serving large commercial and ratepayers who benefit from net saving of energy efficiency measures. The IPMVP is sponsored by the Efficiency Valuation Organization (EVO), committed to "develop and promote standardized methods to quantify and manage the risks and benefits associated with business transactions on end-use energy efficiency, renewable energy and water efficiency."[77] A federal program should consist of guidelines and protocols for business practices for the measurement, verification and reporting of the net energy and capacity savings of utility energy efficiency programs. The Electric Consumers Resource Council recommends a protocol consisting of national standards that includes common definitions, minimum allowable methods, statistical rigor, compliance measures and training requirements. "The protocol should be vetted on an on-going basis by an organization such as the North American Energy Standards Board (NAESB) using procedures that have been accredited by the American National Standards Institute (ANSI). The role of a process that is ANSI certified is very important for ensuring near universal credibility."[78]

---

[77] Efficiency Valuation Organization, *International Performance Measurement and Verification Protocol: Concepts and Options for Determining Energy and Water Savings*, Volume 1, April 2007

[78] Utility Energy Efficiency Programs: Too Cheap to Meter? A Policy Brief of the Electricity Consumers Resource Council, November 2008; www.elcon.org

Table 4.1 Estimates of U.S. Efficiency Potential as a Percent of End-Year Forecast Consumption

Study Ref	IWG (1997)	IWG (2000)	Elliott & Shipley (2005)	McKinsey Global Institute (2007)	Brown et al. (2008)	EPRI (2009)
End Year	2010	2020	2020	2020	2030	2030
Length (years)	13	20	15	13	20	22
Technical						
Residential	–	–	–	–	–	–
Commercial	–	–	–	–	–	–
Industrial	–	–	–	–	–	–
Total	–	–	–	–	–	– (29/–)
Economic						
Residential	–	– (37/12)	–	38 (–/–)	– (30/28)	–
Commercial	–	– (26/26)	–	17 (–/–)	– (34/35)	–
Industrial	–	–	–	a	–	–
Total	–	–	–	20 (–/–)	–	– (14/–)
Maximum Achievable						
Residential	12 (17/3)[1]	21 (27/8)	–	–	–	–
Commercial	13 (15/5)[1]	19 (22/8)	–	–	–	–
Industrial	13 (15/14)	17 (22/11)	–	–	–	–
Total	13 (16/9)[2]	19 (24/9)[2]	–	–	–	– (11/–)
Moderate Achievable						
Residential	5 (7/1)[1]	9 (13/2)	–	–	–	– (8/–)
Commercial	6 (6/9)[1]	9 (11/7)	–	–	–	– (9/–)
Industrial	7 (8/7)	7 (7/5)	–	–	–	– (8/–)
Total	6 (7/6)[2]	8 (10/5)[2]	– (11/10)	–	–	– (8/–)

Savings shown as percent of end year consumption for: 'all fuels (electricity/natural gas)'. Combined, these studies account for 18 estimates for all fuels, 22 estimates for electricity, and 11 estimates for natural gas that included (or allowed calculation of) a percentage of end-year forecast savings.

– Estimate not presented in report
a Estimate provided but percent not calculated
[1] Includes all fossil fuels
[2] Calculated by authors

Solutions not Dependent on Future R&D. Consumers have the choice of energy-efficient products in lighting, appliances, transportation, building materials, energy monitoring, and onsite energy generation. Many additional products and improvements are slated to come on the market. The solutions to energy conservation is not dependent on R&D, but can be implemented at the individual, community, city, State and Federal levels. A big driver in promulgating efficiency and conservation programs is through EERS involving the public, private entrepreneurs, utilities, local, and Federal government.

Cost Effectiveness. Energy efficiency is described as a proven, cost-effective energy resource and the only policy solution that could provide near-term relief, stretching available energy sources while providing price relief to consumers (Elloitt, 2006). ACEEE estimated a benefit-to-cost ratio of 2.6 for a National EERS of 0.75 percent per year (after a two year ramp-up period) over the period 2007-2020 (Nadel, 2006b).

In the near term, energy efficiency and conservation measures offer the quickest, most cost-effective methods to reduce growing demand and mitigate climate change. Approximately 25 percent of total electricity use can be saved at an average cost of $.03/kWh whereas new generation sources cost $.05/kWh (Laitner, Ehrhardt-Martinez, and Prindle, 2007).

The savings from energy efficiency are compounded over time as residential energy prices have trended up over the past several years (following an historic decline since the mid 1980s) (EIA, 2008e, Table 8.10). Dollar for dollar, energy efficiency is one of the best energy investments that the country can make. ESCOs can play a significant role in a Federal EERS program. For example, Energy Performance Services (EPS) Capital Corp. has been active in the performance contracting ESCO industry since 1981. They have formed ESCOs in 10 countries and developed EEPS in over 25 countries. Most recently EPS Capital Corp. has a $100 million joint venture in Hong Kong to finance EERS for ESCOs in mainland China on a paid-from-savings basis. USAID has a project in Armenia to train ESCOs in structuring and securing financing for EERS and training and educating local financial institutions in the assessment of EERS. There are about 60 active ESCOs in the U.S with estimated revenues of $3.6 billion (in 2006). Energy efficiency accounted for almost three-fourths of industry revenues ($2.5 billion).

Consumer-sited generation, including renewables, is a growth area for ESCOs, representing 16 percent of their revenues in 2006. Lawrence Berkeley National Laboratory (LBNL) has a database of nearly 1,500 case studies of energy-efficiency projects completed by ESCOs. The median benefit/cost ratio is 2.1 for 309 private sector projects and 1.6 for 771 institutional sector projects. School, government, and health care/hospital projects represent ~74 percent of market activity for ESCOs. Nearly half of the activity is focused in four States (New York, New Jersey, California, and Texas), where the median cost of projects is $0.7M. Eighty-three percent of private sector projects pay back in six years or less versus 44 percent of Institutional Sector projects. ECSOs are active service providers to State and local governments.

DOE has a list of 16 "Super ESCOs" for renovations to U.S government facilities funded by the ARRA of 2009. ESCOs use multiple business models for implementation of energy efficiency projects through ESCO route. Two popular models are: Guaranteed Savings Model and the Shared Savings Model. Some ESCOs have the resources that allow them to fund the customer's project. ESCO may receive money from a Public Benefit Fund (PBF). Sometimes the customer may have sufficient funds of its own to finance energy efficiency re-fits. Any lingering doubts it may have about using its own resources to fund the project is allayed by the energy savings guarantee built into the contract. The company's accountants do the math to determine whether the investment is worth it or not.

ESCOs constitute a thriving national industry: Between 1990 and 2006 alone, 20 percent average annual growth culminated in 2006 revenues totaling \$3.6 billion. Over this period, ESCOs served a majority institutional (Federal and MUSH[79]) client base – Federal, MUSH, and private sectors respectively accounting for 22 percent, 58 percent, and only 20 percent of project investments.

PI-50 conducted an extensive literature survey, interviews with industry experts,[80] and independent analysis. The analysis also drew on the LBNL database of nearly 1,500 case studies of energy-efficiency projects completed by ESCOs (Hopper et al., 2007). The findings collectively highlight ESCOs' strong record and potential for enabling cost-effective GHG emissions reductions. In particular:

- ESCOs' main business line is defined by energy efficiency (primarily lighting and HVAC system retrofits) in large institutional buildings. For such projects, LBNL studies report median energy savings of 15-20 percent, mainly (80 percent) from reduced electricity consumption.
- Buildings account for over 40 percent of U.S. energy consumption (20.4 EJ and 570 $MtCO_2$ associated emissions, in 2006 alone); ESCOs currently access Federal and MUSH, but not private, market segments; they therefore capture only a two percent share of the total buildings market and associated GHG mitigation potential.
- Prior to the current economic recession, capital costs for a typical Federal project were determined by the going market rate of about 5-6.5 percent. At a seven percent discount rate, over 70 percent of ESCO projects remain cost-effective.
- Assuming a seven percent discount rate, the average Federal ESCO project achieves energy and emissions reduction rates, per unit investment, of 1.24 GJ/US\$ and 4.55 tCO_2/US\$ – exceeding 2500 GJ and 9 $MtCO_2$, at a median benefit-cost ratio of 1.6, over a typical 14-year project lifetime.
- Thus ESCO projects already demonstrate high energy-saving potential and correspondingly deep CO_2 emissions reduction opportunities.

---

[79] MUSH stands for municipal/state government, universities, schools, and hospitals.

[80] Interviewees included aurhors of two widely referenced studies (Goldman, Hopper and Osborn, 2005 and Hopper et al., 2007) and the President of the National Association of Energy Services Companies (NAESCO).

- Policy measures such as subsidies, to lower capital costs, would further improve ESCOs' already positive cost-benefit characteristics – thereby expanding existing markets; enabling access to as-yet untapped markets; and cost-effectively amplifying energy and environmental benefits, both on a per-project and aggregate basis (specific projections available upon request).

Administrative Practicality. Because there is extensive policy experience with EERS, and EERS-like policies, they can be assumed to be administratively feasible. The Federal role is limited to developing and enforcing regulations, providing incentives, and establishing and monitoring an energy savings market. These actions have been taken for other areas, and are not expected to be significantly burdensome.

Funds to support administration and program costs of EERS could be captured in part through public benefits funds (PBFs). Over two dozen States and the District of Columbia have increased electricity surcharge ("wires charge") nominally to create a guaranteed stream of funds for energy efficiency. PBFs support projects to increase energy efficiency, renewable energy, low-income energy assistance, and energy R&D. State PBFs spend almost $1 billion per year just on energy-efficiency projects. A National "wires charge" could fund a Federal PBF. The Alliance to Save Energy estimates that a surcharge of a one tenth of one cent per kWh would provide $3.7 billion per year, and would add less than $1 to the average residential monthly bill.[81]

Additionality. EERS set a target, goal, or requirement for efficiency to meet compared to forecast consumption. Other policies designed to drive efficiency could be used to meet this target, goal, or requirement.

4.3.6 Summary

It is recommended that the Federal government provide incentives and supporting policies (such as rules, measurement and verification protocols, and a market for trading energy savings), for States to develop EERS for electricity and natural gas. The benefits of energy-efficiency policies generally outweigh their costs, and with attention to measurement and verification of savings, EERS can support the lowest cost savings through trading of credits. Opposition to a National EERS may be due to equity, economic, environmental, or Federalist issues.

---

[81] Energy Efficiency in the Utility Sector Fact Sheet: http://www.ase.org/content/article/detail/2861

5 Conclusions

The energy-efficiency gap in the U.S. residential sector is large; at the same time, homes are responsible for more than one-fifth of the nation's energy-related carbon dioxide emissions. If key barriers that impede investments in energy-efficient technologies and practices could be removed, homes could become a significant part of the solution to the global climate challenge.

Using a uniform set of policy evaluation criteria, this report has examined seven promising policy options that target residential energy efficiency.[82] Two of these options promote energy-efficient residential construction, two target energy-efficiency improvements to existing buildings, and three others focus on utility-based policy options to promote the efficient use of energy by residential customers. Table 5.1 summarizes our evaluation of these seven policy options.

In addition to the seven evaluation criteria, this table shows anticipated time to significant savings after adoption of a particular policy. Even for those policies that have medium or long time horizons, savings begin to accrue shortly after adoption and build up over time. For example, savings from the stronger enforcement of advanced building codes is constrained by the small increment of new construction each year relative to the existing building stock. In general, policies targeted at new construction offer longer term potential, while policies that target existing structures typically yield quicker impacts. Both are important for a balanced approach. Figure 5.1 offers a stylized example of temporal impacts of policies in the two sub-sectors; time = 0 is assumed to be the point of policy implementation.

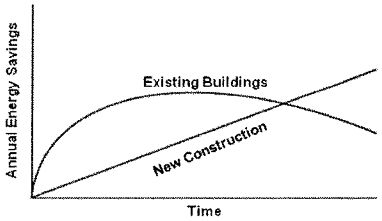


Figure 5.1 Timeline of Anticipated Energy Savings from Alternative Policy Targets

On the one hand, each of the seven policy options is judged to be cost effective. In addition, most of them have a strongly defensible Federal role, have broad applicability to the residential sector, offer significant potential benefits, and are able to be implemented without further research and development. Most are also seen as strong in terms of "additionality" – that is, their impacts are not made redundant when other policies are implemented.

---

[82] As noted in the introduction (see Table 1.1), these policies are not necessarily limited to targeting the residential sector; however, this document was designed to focus on their implementation and effect in the residential sector.

Table 5.1 Summary Assessment of Policy Options

	Strengths	Weaknesses	Time Horizon*
Policy Options to Promote Energy-Efficient Residential Construction			
Advancing and Enforcing State Building Energy Codes	Significant Potential Benefits, Cost-Effectiveness, Additionality	Administrative Practicability, Stricter Codes Require Improved Technologies	Medium to Long
Expanded Use of Home Energy Performance Ratings	Broad Applicability, Potential Benefits, Cost-Effectiveness	None	Short to Long (depends on policy using them)
Policy Options to Promote Energy-Efficient Improvements to Existing Residences			
Mandated Disclosure of Energy Performance Information	Appropriateness of the Federal Role, Broad Applicability, Technology is Commercially Available Today, Cost-Effectiveness	Administrative Practicability, Additionality	Medium to Long
On-Bill Financing of Energy-Efficiency Improvements	Appropriateness of the, Broad Applicability, Technology is Commercially Available Today, Significant Potential Benefits, Cost-Effectiveness	Administrative Practicability	Short to Medium
Utility-Based Policy Options to Promote Energy-Efficient Buildings			
Performance Specifications for Smart Meters and Demand Response	Broad Applicability, Significant Potential Benefits, Cost-Effectiveness, Additionality	Administrative Practicability	Short (for demand response effect) to Long (for savings from performance specifications)
Alignment of Utility Financial Incentives with Customer Energy Efficiency	Broad Applicability, Technology is Commercially Available Today, Significant Potential Benefits, Cost-Effectiveness, Additionality	Administrative Practicability	Medium
National Energy Efficiency Resource Standard	Technology is Commercially Available Today, Significant Potential Benefits, Cost-Effectiveness	Administrative Practicability, Additionality	Medium

*Time horizons when significant energy savings begin: short (5 years or less), medium (5 to 10 years), and long (more than 10 years).

On the other hand, a majority of the policy options have issues of "administrative practicability." In several cases, new institutions or capabilities must be established, as is true with the creation of a third-party compliance system for building codes and the establishment of a revolving loan fund for on-bill financing. In other cases, new legislation is required (e.g., for mandating the disclosure of energy performance information), new utility commission rate-making rules must be established (e.g., to re-align utility financial incentives), or new Federal standards must be set (as with smart meters and a National energy-efficiency portfolio).

These same issues of administrative practicability could slow down the pace of energy savings, and therefore tend to be associated with more protracted time horizons for energy savings. The National energy-efficiency portfolio standard is an exception to this, since legislative proposals are already being debated. The concept of administrative practicability and its relationship to individual policies is not static. As legislation is passed and experience is gained with implementation, those policies that seem less practicable ex ante may be found to require little administrative effort ex post. This is especially the case for those policies that require an initial hurdle, such as development of standards or enabling of mechanisms not in practice today. Thus, having administrative practicability for a "weakness," as presented here should not be interpreted to mean that the policy is overly burdensome from an administrative standpoint.

Two policy options are judged to be weak in terms of "additionality:" mandated disclosure of energy performance information, because the gap it fills could also be addressed by other policies that increase the perceived value of efficiency; and a National energy-efficiency portfolio standard, because standards tend to be met with a diverse package of policy options to increase efficiency.

The only policy option that faces the need for ongoing technology R&D is the advancement of state energy codes; here it is assumed that stronger codes in the future will require new and improved technologies. While the benefits of other policies typically would be enhanced by the availability of improved technologies, their cost-effectiveness is favorable based on best-practice technologies in the marketplace today.

While the success of most of the seven policies studied here does not depend on further technology R&D, they would profit from greater social science research in the area of energy efficiency in homes. Energy efficiency policies repeatedly fall short of their potential impacts for lack of insights and information that could help policymakers and program implementers understand their target audiences. As a strategy for highlighting high-potential social science research, we consider the kind of knowledge and understanding that would help inform the design and implementation of each of the seven policies discussed in this report.

Box 5.1 Illustrative Social Science Research to Support Residential Energy Policy Design and Implementation

#1: Advancing and Enforcing State Building Energy Codes

- How can homeowners be made aware of residential building code features so that they can exert "demand pull" to ensure effective construction practices?
- How can homebuilders and inspectors become better informed about the mechanics and importance of building code compliance?
- What is the best way to train the workforce of building code enforcement officials?

#2: Expanded Use of Home Energy Performance Ratings

- In what units should ratings be presented (abstract scales like the 1-100 HERS, energy units, dollars)?
- What rating information would be most credible and influential to each of the potential user groups (home buyers, home renters, rental property owners, architects, builders, mortgage lenders, real estate agents, etc.)?
- Should ratings take into account variations in building use due to household size, life cycle, behavioral differences, etc.? If so, how?

#3: Mandated Disclosure of Energy Performance Information

- How, when, and by what media should information disclosure be mandated?
- What specific information should be disclosed?
- If peer pressure is as highly influential as research suggests, how can the disclosed information be most usefully packaged to provide homebuyers and sellers with useful comparative information?

#4: On-Bill Financing of Energy-Efficiency Improvements

- What segments of the population would likely respond most favorably to on-bill financing as a means of retrofitting their homes?
- What are the sources of utility resistance to this policy and how can they be overcome?
- What are the possibilities for non-utilities to provide long-term funding of efficiency improvements? (e.g., appliance retailers, NGOs, state or local government agencies)
- What are the possibilities for financing of these improvements as part of mortgages and refinances?

Box 5.1 Illustrative Social Science Research to Support Residential Energy Policy Design and Implementation (cont.)

#5: Performance Specifications for Smart Meters and Expanded Demand Response

- How frequent should feedback be? In what units should it be given for greatest effectiveness with consumers?
- Do different types of consumers need different types of information (e.g., Internet, home thermostat, …)
- How can meters be designed for convenient and meaningful use by home occupants who vary dramatically in levels of technological sophistication?
- What programs can be designed to maximize behavioral response to smart meters, with or without time-of-use pricing?
- What consumer education is necessary to maximize the impact of smart meters, and how can it most effectively be delivered?
- How can smart whole-home meters be combined effectively with technologies for measuring usage for particular outlets, switches, or pieces of equipment?

#6: Alignment of Utility Financial Incentives with Customer Energy Efficiency

- What are the sources of utility resistance to this policy and how can they be overcome?
- If concerns about measurement and verification are as critical as they appear to be, how can utility program managers gain experience and become more confident with program evaluation practices?
- Who are the stakeholders that would benefit or suffer as a result of a major shift to utility-managed efficiency programs, and how can the concerns of the opposition be best addressed?

#7: National Energy Efficiency Resource Standard (EERS)

- What are the sources of utility resistance to this policy and how can they be overcome?
- If concerns about measurement and verification are as critical as they appear to be, how can utility program managers gain experience and become more confident with program evaluation practices?

Further analysis of the interactions between the seven policies is presented in the Table 5.2. A "+" indicates that the row policy is expected to reinforce the column policy, perhaps by providing an enabling capacity or by addressing a common barrier. A "-" indicates that a row policy may duplicate some of the intended savings of the column policy, perhaps by targeting energy-efficiency investments in the same market segment or by eliminating a barrier that was a common focus of the two policies. Note that only one policy is seen as significantly duplicating or overlapping with the energy savings of another policy. In particular, if compliance with building codes is effectively enforced, then mandatory disclosure of home energy performance would become less important over time as performance information would be more readily known. In contrast, there are numerous examples of reinforcing policies:

Table 5.2 Complementariness of the Seven Policy Options
(+ = driving or reinforcing, - = duplication or overlap)

	1	2	3	4	5	6	7
[1] Advancing and Enforcing State Building Energy Codes			-				
[2] Expanded Use of Home Energy Performance Ratings	+		+	+			+
[3] Mandated Disclosure of Energy Performance Information		+		+	+		
[4] On-Bill Financing of Energy-Efficiency Improvements		+			+		
[5] Performance Specifications for Smart Meters and Expanded Demand Response		+		+			+
[6] Alignment of Utility Incentives with Customer Energy Efficiency					+		
[7] National Energy Efficiency Resource Standard (EERS)		+	+	+	+		

- Home energy performance ratings can be used to verify compliance with building codes [1] and provide input to mandatory disclosure [3], on-bill financing of retrofits [4], and EERS [7].
- Mandatory disclosure of energy performance information could drive demand for greater information about home energy use through performance ratings [2] (to determine cost-effective improvements) and smart meters [5], and could enable greater use of creative retrofit funding sources such as on-bill financing [4].
- On-bill financing may also drive greater demand for information about home energy use through performance rating s [2] (to determine cost-effective improvements).
- Smart meters and demand response efforts could drive demand for greater information about home energy use through performance ratings [2] (to determine cost-effective improvements) and greater use of creative retrofit funding sources such as on-bill financing [4].
- Aligning utility incentives with efficiency is likely to increase the priority for demand response [5] efforts on the part of utilities and will motivate utilities to help meet and possibly exceed EERS goals [7].
- A Federal EERS will increase the value of efficiency, thus it will likely drive utility interest in demand response [5] and on-bill financing. Similarly, it could drive demand

for greater information about home energy use through performance ratings [2] (to determine cost-effective improvements) and greater use of creative retrofit funding sources such as on-bill financing [4].

Adaptation and flexibility are important to ensure that reinforcing policies do not become competing policies (Boonekamp, 2006; CCCSTI, 2009).

In totality, these policy options suggest an array of complementary cost-effective Federal actions that could enable homes to become strong contributors to global climate solutions. Without such policy initiatives, it will be difficult to shrink the energy-efficiency gap in the U.S. housing market.

6 References

Alexander, Barbara. 2007. "Smart meters, real-time pricing, and demand response programs: Implications for low-income electric customers." http://www.pulp.tc/Smart_Meters__Real_Time.pdf

Allen, Mahalley D., Carrie Pettus, and Donald P. Haider-Markel. 2004. "Making the National Local: Specifying the Conditions for National Government Influence on State Policymaking." *State Politics and Policy Quarterly* 4(3): 318–44

Alliance to Save Energy. 2005. "Blueprint for Energy-Efficiency Acceleration Strategies for Buildings in the Western Hemisphere." Washington, DC: Alliance to Save Energy.

Alsever, Jennifer. 2007. "Want a green house? Prepare to be confused." MSNBC, May 7. http://www.msnbc.msn.com/id/18472719/

American Council for an Energy-Efficient Economy (ACEEE). 2009. "Success with energy Efficiency Resource Standards." http://www.aceee.org/energy/state/EERS_statesuccess0109.pdf

Australian Greenhouse Office. 2005. International Directions For The Mandatory Disclosure Of The Energy Performance Of Buildings. http://www.nfee.gov.au/public/download.jsp?id=199

Barr, S., A. Gilg, and N. Ford. 2005. "The household energy gap: examining the divide between habitual- and purchase-related conservation behaviors." *Energy Policy* 33: 1425-1444.

Bartholomot, Henri. 2007. "EEI Views on the EIA Electric Survey Forms." Presented at: EIA Energy Outlook, Modeling, and Data Conference, March 28, Washington, DC. Http://www.eia.doe.gov/oiaf/aeo/conf/bartholomot/bartholomot.ppt

Bell, Luke. 2008. "Energy Efficiency Issues in Residential Housing." Presented at: National Association of Realtors 2008 Government Affairs Directors Institute, July 23-26, Jackson Hole, Wyoming. http://www.realtor.org/gadConf.nsf/files/gad_institute_08_luke.pdf/$FILE/gad_institute_08_greenbldg_luke.pdf

Belson, Ken. 2008. "Rewarding those who wait to flip the switch," New York Times: July 21, 2008. http://www.nytimes.com/2008/07/21/nyregion/21peak.html

Bernstein, Mark and James Griffin. 2005. "Regional Differences in the Price-Elasticity of Demand for Energy." The RAND Corporation; prepared for the National Renewable Energy Laboratory. http://www.rand.org/pubs/technical_reports/2005/RAND_TR292.sum.pdf

Berry, Linda and Martin Schweitzer. (2003). "Metaevaluation of National Weatherization Assistance Program Based on State Studies, 1993–2002." Oak Ridge, TN: Oak Ridge National Laboratory, Report No. ORNL-CON/488. http://weatherization.ornl.gov/pdf/CON_488.pdf

Boonekamp, Piet. 2006. "Actual interaction effects between policy measures for energy efficiency – A qualitative matrix method and quantitative simulation results for households." *Energy* 31: 2848-2873.

Borenstein, Severin. 2002. "The Trouble with Electricity Markets: Understanding California's Restructuring Disaster." *Journal of Economic Perspectives*, 16(1): 191-211.

Borenstein, Severin, Michael Jaske, and Arthur Rosenfeld. 2002. "Dynamic Pricing, Advanced Metering, and Demand Response in Electricity Markets. Center for the Study of Energy Markets." http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1005&context=ucei/csem

Boulin, Jean. 2009. Personal communication, May 14.

Brown, Marilyn A. and Sharon (Jess) Chandler, 2008. "Governing Confusion: How Statutes, Fiscal Policy, and Regulations Impede Clean Energy Technologies," *Stanford Law and Policy Review* (19) 3: 472-509. http://slpr.stanford.edu/previous/Volume19.html#Issue3

Brown, Marilyn A., Sharon (Jess) Chandler, Melissa V. Lapsa, and Benjamin K. Sovacool. 2008. "Carbon Lock-In: Barriers to the Deployment of Climate Change Mitigation Technologies." Oak Ridge, TN: Oak Ridge National Laboratory, ORNL/TM-2007/124, http://www.ornl.gov/sci/eere/PDFs/Carbon_Lock_In_Report.pdf

Brown, Marilyn A, John A. Laitner, Sharon Chandler, Elizabeth D. Kelly, Shruti Vaidyanathan, Vanessa McKinney, Cecelia Logan, and Therese Langer. 2009. *Energy Efficiency in Appalachia*, Prepared for the Appalachian Regional Commission. http://www.seealliance.org/pdf/ARC_Final_March09.pdf

Brown, Marilyn A. and G. Reeves. 1986. "General Public Utilities: Buying Residential Energy Conservation" in *Financing Energy Conservation*, ed. M. Weedall, R. Weisenmiller, M. Shepard, pp. 123-132. Washington, D.C.: American Council for an Energy Efficient Economy.

Brown, Marilyn A. and Frank Southworth, 2008. "Mitigating Climate Change through Green Buildings and Smart Growth," *Environment and Planning A* (40): 653-675.

Brown, Marilyn A., Frank Southworth, and Therese Stovall. 2005. "Towards a Climate-Friendly Built Environment." Arlington, VA: Pew Center on Global Climate Change. http://www.pewclimate.org/docUploads/Buildings_FINAL.pdf

Brown, Marilyn A. and D. L. White. 1988. "Stimulating Energy Conservation by Sharing the Savings: A Community-Based Approach." *Environment and Planning A* 20(4), 517-534.

Brown, Matthew. 2009. *Brief #3: Paying for Energy Upgrades Through Utility Bills.* Washington, DC: Alliance to Save Energy. http://ase.org/content/article/detail/5476

Brown, Rich, Sam Borgeson, Jon Koomey, and Peter Beirmayer. 2008. "U.S. Building Sector Energy Efficiency Potential." Berkeley, CA: Lawrence Berkeley National Laboratory, LBNL-1096E. http://www.osti.gov/bridge/servlets/purl/941430-cn2bC7/941430.pdf

Burr, Michael. 2008. "Snake oil and smart meters: customers deserve the straight truth about electricity costs," editorial. *Public Utilities Fortnightly*, 146(4):4-5.

Casals, Xavier. 2006. "Analysis of building energy regulation and certification in Europe: Their role, limitations and differences." *Energy and Buildings* 38:(5) 381-392.

Casten, Thomas R. and Robert U. Ayres. 2007. *Energy Myth Eight - Worldwide Power Systems are Economically and Environmentally Optimal* in Sovacool, B. K. and Brown, M. A. (eds.) *Energy and American Society – Thirteen Myths* (201-237). Dordrecht: Springer.

Caves, D. W., L. R. Christensen, and J. A. Herriges. 1984. "Consistency of Residential Customer Response in Time-of-Use Electricity Pricing Experiments." *Journal of Econometrics* 26:179-203.

CEATI International, Inc. 2008. "Results of Two-Year Study Demonstrates Residential Electricity Monitors Help Homeowners Conserve Electricity in a Big Way." http://www.bluelineinnovations.com/documents/pr-ceati.pdf

Charles River Associates. 2005. "Impact Evaluation of the California Statewide Pricing Pilot: Final Report." http://www.energetics.com/MADRI/toolbox/pdfs/pricing/cra_2005_impact_eval_ca_pricing_pilot.pdf

Chenevert, Emily. 2008. “Energy Efficiency Issues in Austin.” Presented at: National Association of Realtors 2008 Government Affairs Directors Institute, July 23-26, Jackson Hole, Wyoming. http://www.realtor.org/gadConf.nsf/files/gad_institute_08_emily.pdf/$FILE/gad_institute_08_greenbldg_emily.pdf

Combs, Susan. 2008. “The Home Energy Efficiency Report.” Texas Comptroller of Accounts. http://www.window.state.tx.us/specialrpt/hb3070/96-1350_Home_Energy_Eff_HB3070.pdf

Committee on Climate Change Science and Technology Integration (CCCSTI). 2009. “Strategies for the Commercialization and Deployment of Greenhouse Gas Intensity-Reducing Technologies and Practices.” Washington, DC: U.S. Department of Energy, DOE/PI-0007. http://www.climatetechnology.gov/Strategy-Intensity-Reducing-Technologies.pdf

Cowart, Richard. 2001. “Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets.” Report to the National Association of Regulatory Utility Commissioners, Regulatory Assistance Project. http://www.raponline.org/Pubs/General/EffReli.pdf (accessed 11/9/06)

Darby, Sarah. 2006. “The effectiveness of feedback on energy consumption: A review for DEFRA of the literature on metering, billing, and direct displays.” Environmental Change Institute http://www.defra.gov.uk/ENVIRONMENT/climatechange/uk/energy/research/pdf/energyconsump-feedback.pdf

Department for Environment, Food and Rural Affairs (DEFRA). 2007. “Public Understanding of Sustainable Energy Consumption in the Home.” http://randd.defra.gov.uk/Document.aspx?Document=EV02046_6701_FRP.pdf

Desmedt, Johan, Guy Vekemans, and Dries Maes. 2009. “Ensuring effectiveness of information to influence household behaviour.” *Journal of Cleaner Production*, 17(4): 455-462.

Dirks, J.A., D.M. Anderson, D.J. Hostick, D.B. Belzer, and K.A. Cort. 2008. “Lost Opportunities in the Buildings Sector: Energy-Efficiency Analysis and Results.” PNNL-17623. Richland WA: Pacific Northwest National Laboratory. http://www.pnl.gov/main/publications/external/technical_reports/PNNL-17623.pdf

Ea Energianalyse, Niras, RUC, and 4-Fact. 2008. “Evaluation of the Danish Energy-Saving Activities.” (in Dutch) Prepared for Danish Energy Agency. http://ens.dk/sw78247.asp [Bilagsrapport]

Earle, Robert and Ahmad Faruqui. 2006. "Toward a new paradigm for valuing demand response." *The Electricity Journal* 19(4): 21-31.

Egan, C. and E. Brown. 2001. "An analysis of public opinion and communication campaign research on energy efficiency and related topics." Washington, DC: American Council for an Energy-Efficient Economy. Report No. A013.

Electric Power Research Institute (EPRI). 2008. "Price Elasticity of Demand for Electricity: A Primer and Synthesis." EPRI, Palo Alto, CA. 1016264. http://my.epri.com/portal/server.pt?Product_ID=000000000001016264

Electric Power Research Institute (EPRI). 2009. *Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.: (2010–2030).* Palo Alto, CA: EPRI. Product # 1016987. http://my.epri.com/portal/server.pt?Abstract_id=000000000001016987

Elliott, R.N. 2006. "America's Energy Straightjacket." Washington, DC: Amercian Council for an Energy-Efficient Economy. http://www.aceee.org/pubs/e065.htm

Elliott, N. and A. Shipley. 2005. "Impacts of Energy Efficiency and Renewable Energy on Natural Gas Markets: Updated and Expanded Analysis." Washington, DC: American Council for an Energy Efficient Economy, Report E052. http://www.aceee.org/pubs/e052.htm

Energy Information Administration (EIA). 2008a. *Annual Energy Outlook 2008 with Projections to 2030*, DOE/EIA-0383(2008). http://www.eia.doe.gov/oiaf/archive/aeo08/index.html

Energy Information Administration (EIA). 2008b. "Assumptions to the Annual Energy Outlook 2007," Table 7. http://www.eia.doe.gov/oiaf/archive/aeo07/assumption/pdf/residential_tables.pdf in 3.2

Energy Information Administration (EIA). 2008c. "2005 Residential Energy Consumption Survey; Table US2. Total Households by Fuels Used, 2005." http://www.eia.doe.gov/emeu/recs/recs2005/hc2005_tables/detailed_tables2005.html

Energy Information Administration (EIA). 2008d. "Emissions of Greenhouse Gases Report." DOE/EIA-0573(2007). http://www.eia.doe.gov/oiaf/1605/ggrpt/index.html

Energy Information Administration (EIA). 2008e. *Annual Energy Review* DOE/EIA-0384(2007). http://www.eia.doe.gov/aer/elect.html

Energy Information Administration (EIA). 2009. *An Updated Annual Energy Outlook 2009 Reference Case Reflecting Provisions of the American Recovery and Reinvestment Act and Recent Changes in the Economic Outlook.* SR/OIAF/2009-03. http://www.eia.doe.gov/oiaf/servicerpt/stimulus/excel/aeostimtab_18.xls

Energy Retail Association (ERA). 2008. "Principles and Requirements for Smart Metering." http://www.energy-retail.org.uk/documents/Principlesandrequirementsdocumentv11.pdf

ENERGY STAR. 2008. "ENERGY STAR Qualified New Homes Market Indices for States." http://www.energystar.gov/index.cfm?fuseaction=qhmi.showHomesMarketIndex

Eto, Joseph, Steven Stoft, and Timothy Belden. 1997. "The theory and practice of decoupling utility revenues from sales." *Utilities Policy*, 6(1), 43-55.

Faiers, Adam, Matt Cook, and Charles Neame. 2007. "Towards a contemporary approach for understanding consumer behaviour in the context of domestic energy use." *Energy Policy*, 35(8) 4381-4390.

Farhar, B.C., N.E. Collins, and R.W. Walsh. 1997. "Case studies of energy efficiency financing in the original five pilot states, 1993-1996." (No. NREL/TP--550-22355; Other: ON: DE97000219; TRN: TRN: 97:004253). Golden, CO: National Renewable Energy Laboratory.

Faruqui, Ahmad. 2008. "Inclining toward efficiency: Is electricity price elastic enough for rate designs to matter?" *Public Utilities Fortnightly*, 146(8): 22-27

Faruqui, Ahmad, Ryan Hledik, Sam Newell, and Johannes Pfeifenberger. (2007). "The Value of Five Percent." *The Electricity Journal*, 20(8): 68-77.

Faruqui, Ahmad and Sanem Sergici. 2009. "Household Response to Dynamic Pricing of Electricity – A Survey of The Experimental Evidence." The Brattle Group. http://www.hks.harvard.edu/hepg/

Federal Energy Regulatory Commission (FERC). 2008. "Assessment of Demand Response and Advanced Metering." Staff Report. Washington, DC.

Fischer, Corinna. 2008. "Feedback on Household Electricity Consumption: a tool for saving energy?" *Energy Efficiency* 1(1): 79-104.

Florida Public Service Commission. 2008. "Report to the legislature on utility revenue decoupling."

http://www.psc.state.fl.us/publications/pdf/electricgas/DecouplingReport_To_Legislature.pdf (January 26, 2009)

Freeman, J. and C.D. Kolstad. 2006. *Moving to markets in environmental regulation Lessons from twenty years of experience.* New York: Oxford University Press.

Friedman, Barry, Lori Bird, and Galen Barbose. 2008. "Considerations for Emerging Markets for Energy Savings Certificates." NREL Report NREL/TP-670-44072. www.nrel.gov/docs/fy09osti/44072.pdf

Fuller, Merrian. 2008. *Enabling Investments in Energy Efficiency* Oakland, CA: California Institute for Energy and Environment.

Furrey, Laura A., Steven Nadel, and John A. "Skip" Laitner. 2009. "Laying the Foundation for Implementing A Federal Energy Efficiency Resource Standard." ACEEE Report #E091, Washington DC: American Council for an Energy Efficient Economy.

Gandhi, Nikhil, Paul Gray, Dennis O'Connor, Randall Vagnini, Kim Kiernan, Sharon Baggett. 2008. "On-Bill Financing of Small Business Energy-Efficiency: An Evolving Success Story." 2008 ACEEE Summer Study on Energy Efficiency in Buildings. Washington, DC: American Council for an Energy-Efficiency Economy.

Garrett, Vicki and Tomas M. Koontz. 2008. "Breaking the cycle: Producer and consumer perspectives on the non-adoption of passive solar housing in the US," *Energy Policy,* 36 (4): 1551-1566.

Goldman, Charles, Nicole Hopper, and Julie Osborn. 2005. "Review of US ESCO industry market trends: an empirical analysis of project data." *Energy Policy*, 33: 387-405

Governor's Office of Planning and Research (GORP). 2002. "California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects." http://drrc.lbl.gov/pubs/CA-SPManual-7-02.pdf

Grant, Ruth. 2006. "Ethics and Incentives: A Political Approach." *American Political Science Review,* **100**: 29-39

Green Building Task Force (GBTF). 2008. "Existing Building Committee Policy Review." Presentation, December 2. http://www.seattle.gov/environment/Documents/GBTF_Policy_Synopsis_ExistBldgs.pdf

Harmin, J., E. Vine, A. Sharick. 2007. "The Potential for Energy Savings Certificates (ECS) as a Major Tool in Greenhouse Gas Reduction Programs." San Francisco, CA: Center for Resource Solutions.

Hawkins, Julie and Scott T. Shepherd. 2008. "Enhancing listing data with MLS Green Fields." Realtor Association Executive, Summer. http://www.realtor.org/eomag.nsf/pages/GreenMLS

Hirst, Eric, and Marilyn A. Brown. 1990. "Closing the efficiency gap: barriers to the efficient use of energy." *Resources, Conservation and Recycling*, 3: 267-281.

Hopper, N., C. Goldman, D. Gilligam, T.E. Singer, D. Birr. 2007. A survey of the U.S. ESCO Industry: Market Growth and Development from 2000 to 2006. LBNL-62679. http://www.ucop.edu/ciee/energyeff/financing.html

Howarth, R.B. and B Andersson. 1993. "Market barriers to energy efficiency." *Energy Economics*, 15(4): 262–272.

Interlaboratory Working Group (IWG). 1997. *Scenarios of U.S. Carbon Reductions: Potential Impacts of Energy-Efficient and Low-Carbon Technologies by 2010 and Beyond.* Oak Ridge, TN and Berkeley, CA: Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory. ORNL-444 and LBNL-40533. http://enduse.lbl.gov/projects/5lab.html. Also published in Brown, Marilyn A.; Mark D. Levine; Joseph P. Romm; A.H. Rosenfeld; J.G. Koomey, 1998. "Engineering-Economic Studies of Energy Technologies to Reduce Greenhouse Gas Emissions: Opportunities and Challenges," *Annual Review of Energy and Environment,* 23: 287-385.

Interlaboratory Working Group (IWG). 2000. *Scenarios for a Clean Energy Future*. (Oak Ridge, TN; Oak Ridge National Laboratory and Berkeley, CA; Lawrence Berkeley National Laboratory), ORNL/CON-476 and LBNL-44029. http://www.ornl.gov/sci/eere/cef/. Also published in a special Issue of *Energy Policy* devoted to the *Scenarios for a Clean Energy Future*, M. A. Brown, W. Short and M. D. Levine (eds.) Vol. 29, issue 14, 2001.

Jakob, Martin. 2006. "Marginal Costs and Co-Benefits of Energy Efficiency Investments: The Case of the Swiss Residential Sector." *Energy Policy*, 34.

Kaplow, Louis. 1992. "Rules versus Standards: An Economic Analysis." *Duke Law Journal*, 42: 557.

Kempton, W. and M. Nieman. 1987. "Energy Efficiency: Perspectives on Individual Behavior." Washington DC: American Council for an Energy-Efficient Economy.

King, Jennie. 2007. "M-Power: A Better Way to Keep Customers in Power." Energy Central, Energy Pulse™, http://www.energypulse.net/centers/article/article_display.cfm?a_id=1406

King, Michael, Kathleen King, and Michael Rosenzweig. 2007. "Customer Sovereignty: Why Customer Choice Trumps Administrative Capacity Mechanisms." *The Electricity Journal* 20(1):38-52.

Kordjamshidi, M., and S. King. 2009. "Overcoming problems in house energy ratings in temperate climates: A proposed new rating framework." *Energy and Buildings*, 41(1): 125-132.

Knight, Brian. 2002. "Endogenous Federal Grants and Crowd-out of State Government Spending: Theory and Evidence from the Federal Highway Aid Program." *American Economic Review* 92(1): 71-91.

Kushler, Martin, Dan York, and Patti Witte. 2006. "Aligning utility interests with energy efficiency objectives: A review of recent efforts at decoupling and performance incentives." Washington, DC: American Council for an Energy-Efficient Economy.

Laitner, John A., K. Ehrhardt-Martinez, and W.R. Prindle, 2007. "A White Paper prepared for the Energy Efficiency Forum." Washington DC: American Council for an Energy-Efficient Economy. www.aceee.org/conf/07finance/financeforumwp.pdf

Lausten, Jens and Kristine Lorenzen. 2003. Danish Experience in Energy Labeling of Buildings. OPET network, http://www.opet-building.net

Leadership Group. 2006. *National Action Plan for Energy Efficiency.* http://www.epa.gov/solar/documents/napee/napee_report.pdf

Levy Associates. 2002. "Meter Scoping Study. Prepared for the California Energy Commission." http://www.ucop.edu/ciee/dretd/references/documents/meterscope.pdf

Levy Associates. 2005. "Establishing the AMI Business Case Framework." Presentation. http://www.energetics.com/madri/pdfs/levy_050405.pdf

Linden, A.L., A. Carlsson-Kanyama, and B. Eriksson. 2006. "Efficient and Inefficient Aspects of Residential Energy Behaviour: What Are the Policy Instruments for Change?" *Energy Policy*, 34.

Loper, Joe, Lowell Ungar, David Weitz and Harry Misuriello. 2005. "Building on Success: Policies to Reduce Energy Waste in Buildings." Report to the Alliance to Save Energy. http://www.ase.org/images/lib/buildings/Building%20on%20Success.pdf (accessed 11/9/06)

Lowe, R. and T. Oreszczyn. 2008. "Regulatory standards and barriers to improved performance for housing." *Energy Policy*, 36(12), 4475-4481.

Lucas, R.G. 2001. "Assessment of Impacts from Updating Kentucky's Residential Energy Code to Comply with the 2000 International Energy Conservation Code." PNNL 13525. http://www.energycodes.gov/implement/pdfs/kentucky_res.pdf

Lucas, R.G. 2003. "Assessment of Impacts from Updating Iowa's Residential Energy Code to Comply with the 2003 International Energy Conservation Code." PNNL 14431. http://www.energycodes.gov/implement/pdfs/iowa_2003_iecc_report.pdf

Lucas, R.G. 2006. "Energy Efficiency of the 2003 International Energy Conservation Code in West Virginia." PNNL 16284. http://www.energycodes.gov/implement/pdfs/wv_res_2003_iecc.pdf

Lucas, R.G. 2007. "Assessment of Impacts from Adopting the 2006 International Energy Conservation Code for Residential Buildings in Illinois." PNL 16266. http://www.energycodes.gov/implement/pdfs/il_2006_resfinal.pdf

Lutzenhiser, Loren. 2009. *Behavioral Assumptions Underlying California Residential Sector Energy Efficiency Programs.* Oakland, CA: California Institute for Energy and Environment. http://www.ucop.edu/ciee/energyeff/financing.html.

McKeown, Rosalyn. 2007. "Energy Myth Two – The Public is Well Informed About Energy." In B.K. Sovacool and M.A. Brown (Eds.), *Energy and American society – Thirteen myths* pp. 51-7. Dordrecht: Springer.

McKinsey & Company. 2007. "Reducing Greenhouse Gas Emissions: How Much At What Cost?" http://www.mckinsey.com/clientservice/ccsi/greenhousegas.asp

McKinsey Global Institute. 2007. *Wasted Energy: How the U.S. Can Reach its Energy Productivity Potential.* http://www.mckinsey.com/mgi/reports/pdfs/wasted_energy/MGI_wasted_energy.pdf

McNeely, Phil. 2008. "Home Energy Rating Act, Bill 101 Introduced. Legislative Assembly of Ontario."

http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2059&detailPage=bills_detail_the_bill

Midwest Energy Efficiency Alliance (MEEA). 2006. "Midwest Residential Market Assessment and DSM Potential Study." http://www.mwalliance.org/image/docs/resources/MEEA-Resource-5.pdf)

Miguez, J.L., J. Porteiro, L.M. Lopez-Gonzalez, J.E. Vicuna, S. Murillo, J.C. Moran, E. Granada. 2006. "Review of the energy rating of dwellings in the European Union as a mechanism for sustainable energy." *Renewable and Sustainable Energy Reviews*, 10(1): 24-45.

Mills, E. 2007. "The Home Energy Saver: Documentation of Calculation Methodology, Input Data, and Infrastructure." Lawrence Berkeley National Laboratory, Report No. LBNL- 51938 http://eetd.lbl.gov/emills/PUBS/PDF/Home-Energy-Saver.pdf

Montgomery County. 2008. Transcript of April 22, 2008 Montgomery County Council Meeting. http://www.montgomerycountymd.gov/content/council/pdf/transcripts/2008/04-22-08.pdf

Murtishaw, Scott and Jayant Sathaye. 2006. *Quantifying the Effect of the Principal-Agent Problem on US Residential Energy Use,* LBNL-59773 Rev, http://ies.lbl.gov/node/302

Nadel, S. 2006a. Energy Efficiency and Resource Standards: Experience and Recommendations. http://www.aceee.org/pubs/e063.htm

Nadel, S. 2006b. "Energy Efficiency Resource Standards: The New Kid on the Block." American Council for an Energy-Efficient Economy, NREL Seminar. http://www.docstoc.com/docs/528153/Energy-Efficiency-Resource-Standards---The-New-Kid-on-the-Block

Nanda, Anupam and Stephen Ross. 2008. "The Impact of Property Condition Disclosure Laws on Housing Prices: Evidence from an Event Study using Propensity Scores." University of Connecticut Department of Economics Working Paper Series. http://www.econ.uconn.edu/working/2008-39.pdf

National Academies. 2001. "Energy Research at DOE: Was It Worth It? Energy Efficiency and Fossil Energy Research 1978 to 2000." Committee on Benefits of DOE R&D on Energy Efficiency and Fossil Energy, Commission on Engineering and Technical Systems, National Research Council. Washington, DC: The National Academies Press.

National Association of Realtors (NAR). 2007. "What Buyers Want!" Highlights from the NATIONAL ASSOCIATION OF REALTORS® 2007 Profile of Buyers' Home Features Preferences. http://www.realtor.org/Research.nsf/files/HBFeatures3.ppt/$FILE/HBFeatures3.ppt

National Association of Realtors (NAR). 2008. "Existing Home Sales and Prices Overview." http://www.realtor.org/research/research/ehsdata

National Association of Realtors (NAR). 2009. "Profile of Home Buyers and Sellers, 2008." http://www.realtor.org/research/research/reportsbuysell

National Association of State Energy Offices (NASEO). 2008. "NASEO Home Performance with ENERGYSTAR Webinar" dated September 25, 2008. http://www.naseo.org/taskforces/energystar/documents/Home_Peformance_with_ENERGY_STAR_2008-09-25_Webinar.pdf

Neenan, Bernard and Ross Hemphill. 2008. "Societal benefits of smart metering investments." *The Electricity Journal*, 21(8): 32-45.

New York DPS. 2008. March 2008 DPS Staff Report on Recommendations for the EEPS Proceedings. http://www.dps.state.ny.us/07M0548/07M0548_Staff_March2008_FastTrackUpdateReport.pdf

Office of Housing and Urban Development (HUD). 1992. "Energy PerformanceContracting forPublic and Indian Housing." http://www.huduser.org/Publications/pdf/energy.pdf

Ottinger, Richard L. and Rebecca Williams. 2002. "2002 Energy Law Symposium: Renewable Energy Sources for Development." *Environmental Law* 32, 331-362.

Pacific Gas and Electric (PG&E). 2008. "Residential New Construction Program." http://www.pge.com/mybusiness/energysavingsrebates/incentivesbyindustry/newconstruction/energystar/index.shtml

Parnell, R. and O.P. Larsen. 2005. "Informing the Development of Domestic Energy Efficiency Initiatives: An Everyday Householder-Centered Framework." *Environment and Behavior*, 34.

Pfannenstiel, Jackalyne and Ahmad Faruqui. 2008. "Mandating Demand Response: California's load-management experience argues for formal DR standards." *Public Utilities Fortnightly*, 146(1): 48-54

Poel, Bart, Gerelle van Cruchten, and Constantinos A. Balaras. 2007. "Energy performance assessment of existing dwellings." *Energy and Buildings*, 39(4):393-403.

Prindle, B. 2007. Quantifying the Effects of Market Failures in the End-Use of Energy. Washington, DC: American Council for an Energy-Efficient Economy, ACEEE Report Number E071, http://www.aceee.org/energy/IEAmarketbarriers.pdf accessed 8/5/07.

Prindle, W., N. Dietsch, R.N. Elliott, M. Kushler, T. Langer, and S. Nadel. 2003. Energy Efficiency's Next Generation: Innovation at the State Level. http://www.aceee.org/pubs/e031full.pdf

Radford, Bruce. 2008. "The policy: why many state regulators still have qualms about endorsing smart meters. (SELLING THE SMART GRID) (Florida. Public Service Commission)." Public *Utilities Fortnightly*, 146(4): 46-49.

Raven, R. P. J. M., R.M. Mourik, C.F.J. Feenstra, and E. Heiskanen. In Press. "Modulating societal acceptance in new energy projects: Towards a toolkit methodology for project managers." *Energy*, In Press, Corrected Proof.

Robert Mowris and Associates. 2004. "Evaluation Measurement and Verification Report for the Time-of-Sale (TOS) Home Inspection Program #180-02." Retrieved from http://www.calmac.org

Rogers, Joel. 2007. "Seizing the Opportunity (For Climate, Jobs, and Equity) in Building Energy Efficiency" November, Unpublished Manuscript.

Rosenquist, G., M. McNeil, M. Iyer, S. Meyers, and J. McMahon. 2004. "Energy Efficiency Standards for Buildings and Equipment: Additional Opportunities." Prepared for the National Commission on Energy Policy, Washington, DC.

Russell, Becky. 2006. "The Relationship Between Home Energy Costs and Energy-Related Remodeling Activity." Joint Center for Housing Studies, Harvard University. http://www.jchs.harvard.edu/publications/remodeling/n06-2_russell.pdf

Schweitzer, Martin and Bruce Tonn. 2002. "Nonenergy benefits from the Weatherization Assistance Program: A summary of findings from the recent literature." ORNL/CON-484. Oak Ridge, TN: Oak Ridge National Laboratory.

Scott, M.J., J.M. Roop, R.W. Schultz, D.M. Anderson, and K.A. Cort. 2008. "The impact of DOE building technology energy efficiency programs on US employment, income, and investment." *Energy Economics*, 30(5), 2283-2301.

Sioshansi, Fereidoon and Ali Vojdani. 2001. "What Could Possibly Be Better than Real-Time Pricing? Demand Response." *The Electricity Journal*, 14(5): 39-50.

Smith, D.L. and J.J. McCullough. 2001. Alternative Code Implementation Strategies for States. Office of Building Technology, State, and Community Programs, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy. http://www.energycodes.gov/implement/pdfs/strategies.pdf

Sovacool, Benjamin K. and Marilyn A. Brown. 2009. "Scaling the Policy Response to Climate Change," *Policy and Society* 27: 317-328.

Stein, Jeff Ross and Alan Meier. 2000. "Accuracy of home energy rating systems," *Energy*, 25(4): 339-354.

Stern, Stephanie. 2005. "Temporal Dynamics of Disclosure: The Example of Residential Real Estate Conveyancing." Utah Law Review, 57. http://ssrn.com/abstract=959726

Stern, Paul C. 2008a. "What the Research Literature Has Revealed," unpublished manuscript.

Stern, Paul C. 2008b. "Environmentally Significant Behavior in the Home," *The Cambridge Handbook of Psychology and Economic Behavior,* edited by A. Lewis (Cambridge, UK: Cambridge University Press), pp. 363-382.

Texas Public Utility Commission (TPUC). 2008. "Commission Report on Advanced Metering to the Legislature." http://www.puc.state.tx.us/electric/projects/34610/Commission_Report_on_Advanced_Metering_2008.pdf

Tierney, Susan. 2008. "Pay-as-bid vs. uniform pricing: discriminatory auctions promote strategic bidding and market manipulation." *Public Utilities Fortnightly*, 146(3): 40-48.

Tomain, J. and R. Cudahy. 2004. "Energy Law in a Nutshell." St. Paul, MN: Thomson West.

U.S. Bureau of the Census. 2006. "2005 American Community Survey." Table B25002. Housing Units by Occupancy Status. Http://www.factfinder.census.gov

U.S. Bureau of the Census. 2007. "2006 American Community Survey." Table B25002. Housing Units by Occupancy Status. Http://www.factfinder.census.gov

U.S. Bureau of the Census. 2008a. "2007 American Community Survey." Table B25002. Housing Units by Occupancy Status. Http://www.factfinder.census.gov

U.S. Bureau of the Census. 2008b. "2007 American Community Survey 1-Year Estimates. S2504. Physical Housing Characteristics for Occupied Housing Units." Http://www.factfinder.census.gov

U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy (DOE/EERE). 2003. *Buildings Energy Data Book*. Washington, DC, Table. 5.1.1. http://buildingsdatabook.eren.doe.gov/

U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy (DOE/EERE). 2008. *Buildings Energy Data Book*. Washington, September, Tables 2.3.5 and 2.3.9, http://buildingsdatabook.eren.doe.gov/ChapterView.aspx?chap=2#3

Vine, Edward. 1996. "Residential Building Code Compliance: Implications for Evaluating the Performance of Utility Residential New Construction Programs." LBL 38382. http://www.osti.gov/bridge/servlets/purl/418459-Bsrs72/webviewable/418459.pdf

Vine, Edward and Jan Hamrin. 2008. "Energy savings certificates: A market-based tool for reducing greenhouse gas emissions." *Energy Policy* 36(1) 467-476).

Volden, Craig. 2007. "Intergovernmental Grants: A Formal Model of Interrelated National and Subnational Political Decisions." *Publius*, 37(2), 209-243.

World Resources Institute (WRI). 2008. "Bottom line on energy savings certificates." http://www.wri.org/publication/bottom-line-energy-savings-certificates

Wouters, Peter and Dick van Dijk. 2007. "EPBD Buildings Platform: Overall context and activities - Supersedes information paper P000. European Union, Buildings Platform." http://www.buildingsplatform.eu/cpbd_publication/doc/P039_EN_Overallcontext_p2748.pdf

Xenergy. 1996. *Performance Measurement: Establishing Energy Impacts of Commercial New Construction Programs.* Palo Alto, CA.: Electric Power Research Institute, Report EPRI TR-106924s.

Yang, Brian. 2005. "Residential Energy Code Evaluations: Review and Future Directions." (Building Code Assistance Program) A Joint Project of The Alliance to Save Energy, American Council for an Energy-Efficient Economy, Natural Resources Defense Council. http://www.bcap-energy.org/files/BCAP_RESIDENTIAL_ENERGY_CODE_EVALUATION_STUDY_June2005.pdf

Zing Communications, Inc. 2007. "2007 Commercial Energy Code Compliance Study." http://www.aboutlightingcontrols.org/education/pdfs/2007%20Commercial%20Energy%20Code%20Compliance%20Study.pdf

Zwahlen, Cynthia. 2007. "Loans Available for Saving Energy." *Los Angeles Times.* http://articles.latimes.com/2007/may/02/business/fi-smallbiz2

Responses of

Marilyn A. Brown
Nominee to the Tennessee Valley Authority Board of Directors

To Follow-Up Questions from Members of the Senate Committee on Environment and Public Works

February 23, 2010

Senator Barbara Boxer

1. Your work has looked closely at the benefits from energy efficiency, especially across the South and in Appalachia. You have written that with increased energy efficiency measures "Appalachia can cut the energy bills of its households, businesses and industries, create 'green' jobs and grow its economy."

   What new clean energy and energy efficiency policies would you encourage TVA to use if you were to help shape its next few years on the board? Would you be willing to produce a report for this Committee that describes how those policies could be implemented?

   Several types of energy efficiency policies should be examined for possible implementation in the Tennessee Valley. For example, I would recommend that the following be evaluated:

   - **regulatory approaches (such as appliance standards and modernized/enforced residential building codes),**
   - **financial assistance (such as on-bill financing of building retrofits and municipal bond financing of efficiency upgrades to buildings and manufacturing plants),**
   - **information and technical assistance (such as smart meters and assessments of industrial facility upgrades),**
   - **rate structures and pricing policies (such as time-of-use pricing and net metering for combined heating and power).**

   Some of these are already being considered in TVA's Integrated Resource Planning process. If confirmed, I look forward to examining the results of the IRP process, and I would be delighted to produce a report for the Committee's consideration.

2. You have been a researcher and a leader on helping to develop policies that promote clean energy.

   How can TVA help to lead the nation on the use of innovative clean energy technologies, given its mandate to be a national leader on technological innovation and environmental stewardship?

TVA should consider implementing policies to stimulate adoption of innovative clean energy technologies, particularly those developed by companies and organizations in the region and that are well suited to hot and humid climates with dual heating and cooling seasons. Policies might include, for instance, bulk procurements that enable price reductions from economies of mass production and directories to technologies, product distributors, and service providers of clean energy.

TVA should also consider strengthening its collaborations with Oak Ridge National Laboratory, the nation's largest energy R&D laboratory, which is located in East Tennessee. ORNL is the source of numerous clean energy inventions such as the latest heat pump water heater technology, phase change insulation materials, and systems for deploying industrial waste heat to generate electricity (such as in flat glass manufacturing, steel mills, and cement plants). TVA could help to deploy such technologies and innovations through its distributors and direct serve customers.

3. Your work on energy efficiency and clean energy has examined the potential for job creation.

   What creative energy policy strategies for TVA would you recommend to spur job creation?

   Energy-efficiency improvements in industrial facilities and in homes, offices, and retail businesses tend to be labor intensive per dollar investment. Because they support more jobs per dollar investment compared with large-scale power generation, they generate employment for the nation. In addition, cutting utility costs can help manufacturers and other employers enhance their competitiveness, leading to job expansion from increased sales.

   Expanding the use of energy resources located in the Tennessee Valley (in particular solar, hydro, landfill gas and other bioenergy resources) would also seem to be a promising approach to generating employment in the region.

4. If confirmed, do you agree to meet with EPW staff within the first month of your confirmation to discuss whether the TVA may ask Congress to raise the Authority's debt ceiling, and if so, the reasons for this requested increase?

   Yes. Investments in best available environmental control technologies, in new nuclear power plants, and in energy efficiency programs all require up-front capital. It would be valuable for me, if confirmed, to receive a TVA orientation to gather more information on TVA's current financial situation including future debt requirements. After such I would be pleased to discuss the possibility of raising the Authority's debt ceiling with EPW staff.

5. We're at a pivotal moment for TVA and for this country when it comes to the development and use of clean energy technologies. The TVA Act calls for it to be "a

national leader in technological innovation, low-cost power and environmental stewardship."

If confirmed, would you commit to work on convening a conference with highly respected governmental and non-governmental experts on clean energy technologies, including renewable energy and energy efficiency measures, to collect ideas for a 21 century policy for TVA?

Yes, if confirmed, I would be pleased to work on convening such a conference. Such a conference would provide an excellent opportunity to have experts from across the country discuss their ideas about clean energy technologies and policies that might be suitable for TVA and its distributors and customers. Prior to convening such a conference, it would be valuable for me to be more fully briefed on what TVA has already done in these areas.

6. If confirmed, do you commit to ensure that health and safety issues associated with coal ash and other waste management concerns are fully addressed? And do you agree to provide a timeline in which problems identified to date will be addressed?

   Yes, I commit to ensure that health and safety issues associated with coal ash and other waste management concerns are fully addressed. If confirmed, I also agree to provide a timeline in which problems identified to date will be addressed.

Questions from Senator Thomas R. Carper:

1. As we all know, serious environmental problems have troubled TVA in recent years. As a government entity - the TVA should be a leader in our clean energy economy, not a laggard. Therefore, I believe that it is time we have a change in culture at the TVA. TVA needs a culture that treats public safety as the number one priority overpublic rates. A culture that is dedicated to leading the way in clean, efficient power generation in this country. As a nominee to the Board of Directors of TVA, how are you going to change the culture at TVA and what are some of your ideas on how TVA can be a leader in the clean energy economy, leading our nation towards a clean energy future?

   I understand that TVA has initiatives now underway to ensure a culture that treats public safety as the number one priority over public rates. I look forward to being briefed on these efforts if confirmed.

   The Authority has played an historic role in bringing innovative fossil, hydro, and nuclear technologies to the region. TVA appears certain to contribute to the renaissance of nuclear power in this country. Today, TVA also has the opportunity to provide national leadership in energy efficiency and renewable energy alternatives (in particular solar, hydro, landfill gas, and other forms of biopower). The Authority's leadership in these areas may require a shift in institutional priorities and policy initiatives.

   Utilizing its history of innovation, I am convinced that TVA can continue to provide leadership with clean energy technologies of the future.

2. Due to understaffing and incidents like the fly ash incident, I have heard that morale among the TVA employees is very low. As a nominee to the Board of Directors of TVA, how will you boost employee morale and ensure we retain the best employees?

   I appreciate your bringing this issue of morale to my attention. If confirmed, I will work with the TVA leadership to assess the situation and develop a path forward. That strategy most ensure that TVA's most important asset, its employees, have the resources they need to complete their job responsibilities.

3. As you may know, Senator Alexander and I have introduced a bill to regulate fossil fuel power plant pollution to clean up our nation's air. Currently, TVA's power generation is still heavily dependent on coal. As a nominee to the Board of Directors of TVA, how do you think the TVA could do better in reducing sulfur dioxide and nitrogen oxide emissions?

   If confirmed, I look forward to examining in more detail the options available to TVA. Adding best available control technologies to coal plants that are otherwise efficient, reliable, and viable would seem to be a useful strategy. In some cases, the retirement or conversion of coal plants to natural gas generators or co-firing with biomass should be considered. Adding nuclear, natural gas, and renewable

capacity rather than building new coal plants is another attractive strategy going forward. In addition, it is important to expand energy efficiency programs so that the rapid increase in demand for electricity can be constrained. At this time, I do not have sufficient information to be more specific, but if confirmed I look forward to working with you, Senator Alexander, and other members of Congress to address this important issue.

4. In an October 2009 GAO study (GAO-I 0-47 - Mercury Control Technologies at Coal Fired Power Plants http://www.gao.gov/new.items/dl047.pdf, the GAO found that mercury technology is commercially available, can reduce mercury emission by 90 percent for all coal types, and has been installed on a majority of coal-fired boilers in the United States. And the DOE believes the other boiler types could reduce emissions by blending coal types or using different technologies. In places like Minnesota, adding mercury control technology to local coal plants has only raised household electricity rates by 10 cents a month. Why do you think the TVA has not had a plan to reduce mercury emissions from their coal facilities? As a nominee to the Board of Directors of TVA, how do you think the TV A could do better in reducing mercury emissions from TVA's coal plants?

I have not studied the best available technologies for reducing mercury emissions, but if confirmed, I look forward to learning about possible technologies and strategies.

5. What should the TVA be doing to regulate greenhouse gases? If nominated, how could you foster partnerships between the Department of Energy and the Environmental Protection Agency to help the TVA deploy new greenhouse gas technologies?

In general, a strategy of promoting energy efficiency (including combined heat and power), renewable power (in particular solar, hydro, landfill gas, and other biobased power), nuclear energy, and possibly natural gas generation in the Tennessee Valley would appear to me to be a good strategy for reducing greenhouse gas emissions.

Several types of energy efficiency policies should be examined for possible implementation in the Tennessee Valley, including:

- **regulatory approaches (such as appliance standards and modernized/enforced residential building codes),**
- **financial assistance (such as on-bill financing and municipal bond financing of efficiency upgrades),**
- **information and technical assistance (such as smart meters and assessments of industrial facility upgrades),**

- **rate design and pricing policies (such as time-of-use pricing and net metering for combined heating and power).**

Some of these are already being considered in TVA's Integrated Resource Planning process.

TVA should consider implementing policies to stimulate adoption of innovative clean energy technologies, such as bulk procurements that enable price reductions from economies of scale and directories to technologies, product distributors, and service providers of clean energy.

TVA should also strengthen its collaborations with Oak Ridge National Laboratory, the nation's largest energy R&D laboratory, which is located in East Tennessee. ORNL is the source of numerous clean energy inventions such as the latest heat pump water heater technology, phase change insulation systems, and systems for deploying industrial waste heat in power production.

Questions from Senator James N. Inhofe:

1. TVA is currently in the process of rebuilding community trust following the Kingston accident. What actions in Roane County would you suggest that TVA take to regain community trust they haven't taken already?

   This is an excellent question and, if confirmed, I look forward to learning more about what TVA has done in the past year and examining options for continuing to rebuild community trust in TVA.

   Possible initiatives might include: expanding engagement with communities located near to TVA's power plants; yearly Q&A meetings; increased visibility of TVA senior executives in those communities; and increased involvement of Board members in such activities. Positive community relations and trust are critical to the success of the Authority; if confirmed, I hope to help strengthen these.

2. TVA currently gets almost 50 percent of its power from coal and just over 30 percent from nuclear. What do you think is the optimal mix of coal and nuclear?

   Given the numerous environmental issues surrounding the production of electricity from coal, it would seem prudent not to expand the Valley's reliance on electricity generated from the combustion of coal.

3. Despite the unfortunate accident at Kingston, do you agree that, with the right policies we can use coal cleanly and efficiently to meet a substantial portion of our electricity demand?

   Yes.

4. TVA currently has $26 billion in outstanding debt and debt-like obligations. Do you support seeking an increase in the $30 billion statutory debt ceiling or should TVA increase rates to address the imbalance between forecast revenues and obligations?

   I do not have an opinion on the subject of increasing TVA's debt ceiling or increasing rates. My judgment at this point is that one or the other or both strategies may be required. I know that investment in best available environmental control technologies, in new nuclear power plants, and in energy efficiency programs requires up-front capital. TVA does have some of the cheapest electricity rates in the nation, and this is a great asset for economic development. But perhaps some increase will be needed. I look forward to studying these options in detail, if confirmed.

5. Please provide the Committee with copies of all writings, reports, and advocacy speeches on issues related to TVA.

None of my writings, reports, or speeches discuss TVA's issues directly. However, I have written extensively on clean energy technology and policy options for the nation. I have perhaps 100 publications on this subject. Some of my recent publications are attached.

Questions from Senator Lamar Alexander:

1. TVA has a goal to generate 50% of its power from clean sources by 2020. In order to make it from today's level of 40% to the 50% goal, what specific sources of power do you think should be employed?

   I recommend treating energy efficiency as a clean energy resource, and including it in any clean energy goal for TVA. This would include the use of combined heat and power, which generates power by recycling waste heat. Renewable technologies that reduce electricity consumption by end-users should also be included in the goal, such as geothermal heat pumps and solar water heating.

   More traditional clean supply-side options that merit consideration include renewable resources such as solar photovoltaics, hydro power, landfill gas, and other biobased power, as well as nuclear energy and possibly natural gas generation.

   These are only my preliminary thoughts. I look forward to examining these and any other potentially meritorious clean energy opportunities available to the Valley, if confirmed.

2. Do you support TVA's nuclear power program?

   Yes.

3. Should TVA continue current efforts to build new nuclear power plants at Bellefonte? If so, how many reactors should TVA build at Bellefonte?

   I do not know how many reactors should be built at Bellefonte. Based on my knowledge to date, I would think that finishing the two partially completed units might make sense, but I would want to examine the "business case" for this.

   Also, if confirmed I look forward to understanding the analysis conducted to date to determine whether or not the site is sufficient to support the water, on-site waste, and other needs of building more than these two reactors at Bellefonte, as has been discussed. I understand that scientists at Oak Ridge National Laboratory have developed models that evaluates the match between site characteristics and site requirement for new nuclear plants, which would seem to be appropriate for use by TVA as it considers such decisions.

4. Do you agree that it is a bad idea for TVA to adopt policies that allow putting wind turbines on scenic ridge tops in east Tennessee?

   Yes.

5. Should TVA place a priority on installing latest available technology for the reduction of sulfur dioxide, nitrogen oxides, and mercury emissions from coal plants?

   Yes, any coal plants that are to remain in operation should have best available control technologies added to them as quickly as possible, within the limits of budgets, staff time, and materials.

Senator BOXER. Thank you so much, Ms. Brown.

Ms. Haskew.

STATEMENT OF BARBARA S. HASKEW, NOMINATED TO BE A MEMBER, BOARD OF DIRECTORS, TENNESSEE VALLEY AUTHORITY

Ms. HASKEW. Good afternoon, Madam Chairman and members of this committee. I believe that is Senator Alexander at this time, and I want to thank you for your kind words.

I am honored, certainly, to appear before you today to be considered for appointment to the Board of Directors of the Tennessee Valley Authority. I am also deeply honored by the President's nomination of me for a position on this board. I do want to acknowledge our two daughters who are here today through a great deal of ingenuity, my daughter Bonnie McMullen from Kansas City and my daughter Holly Tambling, who is from California.

Senator BOXER. Welcome.

Ms. HASKEW. I want to also say that my roots run very deep in the Tennessee Valley. Today we make our home on Raccoon Mountain, where TVA's pumped storage facility is located. I can stand in my back yard and look west and see the Sequoyah nuclear plant in the distance.

My education and professional experience of more than four decades have developed management and leadership skills that qualify me, I think, for service on the TVA board. Many of these were developed in leadership positions at the Tennessee Valley Authority and at Middle Tennessee State University. During the 1980s I served TVA as the manager of rates, developing rate structures designed to both provide cost-based revenues and shape TVA's power load. I was part of the team that negotiated rates with TVA power distributors and discussed rate issues with large industrial customers. These involvements deepened my understanding of the needs and concerns of the Valley customers and consumers. It was a challenging decade for TVA and Valley consumers as rising fuel and interest costs produced significant rate increases.

But it was also a period when TVA experimented with alternative technologies and applications. These were designed to use power more efficiently and to price it in ways that encouraged conservation. I built additional leadership expertise over 14 years in the positions, dean of the college of business and as provost and vice president of Middle Tennessee State University, managing hundreds of faculty and staff and large budgets. I also served on professional and public service boards at the national and regional levels, which added to my leadership and governance understanding.

In recent years I have returned to teaching, focusing my research on the interactions in the southeast between energy, economic growth, education and the region's population and labor pools. And to echo your remarks, Madam Chairman, I too have noted and Senator Alexander has emphasized to me that the TVA Act requires board members to affirm support for the objectives and missions of the corporation. These include being a national leader in technological innovation, low cost power and environmental stewardship. As an economist and as a citizen I am focused on these opportunities and challenges that TVA faces as it addresses important questions about power production and use, the increased protection of the environment, and the exciting potential of new technologies.

I believe that I can contribute to these discussions, and I too look forward to answering your questions.

[The prepared statement of Ms. Haskew follows:]

STATEMENT OF BARBARA S. HASKEW
BEFORE THE US SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
FEBRUARY 10, 2010 – WASHINGTON, DC

Good afternoon, Madam Chairman and members of the Committee. I am honored to appear before you today to be considered for appointment to the Board of Directors of the Tennessee Valley Authority.

I am also deeply honored by the President's nomination of me for this position on the TVA Board.

Additionally, I want to express my appreciation to a number of members of the Tennessee Congressional Delegation for their encouragement and support.

My roots run deep in the Tennessee Valley. Today, we make our home on Raccoon Mountain where TVA's pumped storage facility is located. If I stand in my backyard and look west I can see the Sequoyah nuclear plant in the distance.

My education and professional experience of more than 4 decades have developed management and leadership skills that qualify me for service on the TVA Board. Many of these skills were developed in leadership positions at TVA and at Middle Tennessee State University. During the 80s I served TVA as Manager of Rates, developing rate structures designed to both provide cost based revenues and shape TVA's power load. I was part of the team that negotiated rates with TVA power distributors and discussed rate issues with large industrial customers. These involvements deepened my understanding of the needs and concerns of Valley customers and consumers. It was a challenging decade for both TVA and Valley consumers as rising fuel and interest costs produced significant rate increases. It was also a period when TVA experimented with alternative technologies and applications designed to use power more efficiently and to price it in ways that encouraged conservation.

I built additional leadership expertise over 14 years in the positions of Dean of the College of Business and as Provost and Vice President at Middle Tennessee State University, managing hundreds of faculty and staff and large budgets. I also served on professional and public service boards at the national and regional levels which added to my leadership and governance understandings. In recent years I have returned to teaching and focused my research on the interactions in the Southeast between energy, economic growth, education and the region's population and labor force.

The TVA Act requires Board members to affirm support for the objectives and missions of the Corporation. These include being a national leader in technological innovation, low-cost power, and environmental stewardship. As an economist and as a citizen I am focused on the opportunities and challenges TVA faces as it addresses important questions about power production and use, the increased protection of the environment and the exciting potential of new technologies. I believe I can contribute to these discussions. I look forward to answering your questions.

INNOVATIVE RATES HELP MARKET ELECTRICITY

Can market-based rates really work with cost-of-service pricing? Two rate design authorities say "Yes!"

By James N. White & Barbara Haskew

One year ago, TVPPA distributors and their millions of consumers faced new rate structures after months of intensive discussion between TVA staff and TVPPA's Rates and Contracts Committee. A year later, conditions on the TVA power system and the utility industry's competitive climate require a re-examination of the new rates and perhaps development of market-based rate options.

The utility industry's transformation from staid regulation to fierce competition is at least partially fueled by the ambitious construction programs many utilities embarked on in the past decade. Now, with an abundance of power, utilities are anxious to increase electrical usage (build load) to spread and minimize the fixed cost burden of power plants as well as to improve operating efficiency. The search for new electrical usage prompts many utilities to pursue aggressive marketing programs. Although such programs contain a number of innovative features, getting electricity prices "right" seems to be a central and important ingredient.

In the Tennessee Valley today, most consumers' rates are based on an average embedded cost-of-service (C-O-S) study. These rates assure customers that the prices they pay for power fairly reflect the costs the customer's usage places on the power system. Market-based rate options, however, are not intended to replace traditional C-O-S-based rates for firm power. As indicated by Illustration A, C-O-S rates are supplemented and kept lower by market-based rate and power supply options.

Today, over 60 percent of TVA's costs are fixed costs—much of that associated with the nuclear plants TVA began building in the 1970s. With this capacity available, TVA has an ample supply of power with which to serve anticipated electrical usage that will be demanded into the next century. For rates to be kept as low as possible, the capacity needs to be used as efficiently and effectively as possible. If electric customers are attracted to the Tennessee Valley and served above the incremental costs of service, then all ratepayers benefit.

Developing market-based rate options requires that we know more about our customers.

With that in mind, it seems appropriate to consider rate options that will encourage the growth of power usage and minimize the burden of the TVA system's fixed costs borne by each individual ratepayer. Such rates would also encourage economic development and promote regional job growth. The challenge for both TVA and power distributors is to evaluate market-based rate options that will permit the Valley to retain current load and compete for new electric customers.

To be successful, such rate options must recognize that competition exists not only from other electric utilities that have surplus capacity and are seeking new electric customers, but from alternative fuels and attractively priced self-generation units. Developing a marketing program and effective market-based rate options will require that distributors and TVA know more about our customers, ou competitors, and about the costs and risks that such market-based approaches may require.

Recently, members of TVPPA's Energy Services Executive Committee and the TVA rate staff met with a special TVPPA Innovative Rate Subcommittee to consider a challenging rate agenda that can be an important component of any future marketing effort. This group addressed three important questions:

1. What do we know about our

Jim White is manager of Gibson County EMC, Trenton, TN, and chairman of TVPPA's Rates and Contracts Committee. Barbara Haskew is Chief of the Rate Design Staff in TVA's Office of Power, Chattanooga.

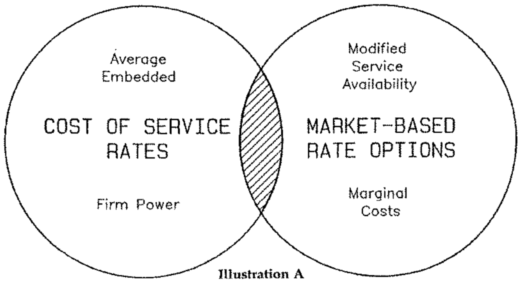


Illustration A

customers' demands for energy?

2. What do we know about our competition?

3. What are our costs and risks?

Our Customers' Energy Demands

Studies show that some of our customers are more price-sensitive than others.

Price-sensitive customers—for whom electricity is a major part of their lifestyle or production process—would be willing, with lower prices, to increase their electricity use or to switch to electricity from alternative fuel. Attracting price-sensitive customers by market-based rate options could increase electricity usage and contribute toward an improved rate outlook for the future.

Other consumers value price stability over price level. Providing these customers with a guaranteed electricity price for a certain period or a guaranteed rate increase amount could be an important marketing tool.

Our Competition

Competition is becoming fierce with gas suppliers and surrounding electric utilities. Gas suppliers, anxious to increase their share of the space and water heating markets, are pricing these applications below electricity and providing additional incentives such as attractive prices on equipment. Recent survey results however, indicate that electricity is still valued by residential consumers for its cleanliness and safety. That means the electric industry would lose fewer customers in the space and water-heating markets (and might add new customers) if electricity for these uses could be priced more competitively.

> ***The search for new electrical usage prompts many utilities to pursue aggressive marketing programs. Although such programs contain a number of innovative features, getting electricity prices "right" seems to be a central and important ingredient.***

Surrounding electric utilities are providing stiff price competition, thus inviting industrial customers to move to sites outside the Tennessee Valley where power is priced more attractively. Such loads, besides being more sensitive to the price of electricity than smaller customers, represent growth opportunities in the regional economy and a significant source of new jobs.

In today's marketplace, such customers find themselves in a buyer's market and are prepared to shop for the most competitive price and power supply arrangements. Thus, many neighboring electric utilities are offering a variety of rate options, including interruptible power rates, time-of-day rates, and a diverse menu of special offerings for end use applications that are tailored to customer needs and wants.

Some innovative rate options are already in place for TVA customers, including Limited Interruptible Power (LIP) supply arrangements which encourage power usage by selling non-firm power to large industrial customers at rates closer to marginal cost. These arrangements provide important new flexibilities to TVA power system operators and planners since LIP customers agree to provide TVA the right to interrupt their power for extended periods of time so TVA can better match demand and supply in periods of lengthy outages. Today, with 1,100 MWs per month of industrial load contracted under LIP arrangements, interruptable power becomes a prime marketing tool for attracting price-sensitive industrial customers to the Tennessee Valley.

The most recent innovative rate design TVA put in place is Economy Surplus Power (ESP) supply arrangements. ESP is real-time pricing based on TVA's incremental cost of supplying energy around the clock. Computer technology permits the instantaneous transmission of pricing information and induces industrial consumers to add additional load when they can take advantage of TVA's lowest costs. TVA and distributors are now exploring ways in which ESP can be made available to distributor-served customers.

Costs and the Risks

For a marketing effort using innovative rates to increase electrical usage in such a way that will benefit all cus-

(Continued on page 26)

THE DESIGN BEHIND THE RATES

Since new rate structures were introduced in 1986, many TVPPA distributor-managers have wanted to know more about the rate design process and how to explain complex rate structures to their retail consumers. To meet this need, TVPPA and the TVA rate staff have organized a *Rate Design Seminar* for TVPPA managers and their key staff members.

The *Rate Design Seminar* focuses on specific elements of TVA's and distributors' costs and how these costs are passed through to the retail consumer. The seminar covers firm power rates and the need in the future for a menu of market-based rate options the distributors can use to respond to the competitive challenges they face in their individual service areas.

Specific areas covered by the *Rate Design Seminar* include:

- TVA and Distributor Costs — How do they contribute to the 1988 wholesale and retail rates?
- Why are today's rates so complex? How can they be explained to retail consumers?
- What characteristics of the retail loads (load factor and diversity) influence the costs passed through to the retail consumer?
- How well are the current rates working?
- The Competitive Yardstick — Where do we stand?
- How do cost-of-service based rates and market-based rates complement each other?
- What is our rate agenda for the future?

The TVPPA/TVA *Rate Design Seminar* is scheduled for Wednesday, October 21, 1987 at the Park Suite Hotel in Nashville. To register for the seminar by phone, call Anne Brown at TVPPA, 615/756- 6511. To reserve a room at the Park Suite Hotel, call 615/436-9211. Tell them you are attending the TVPPA seminar.

SSEB Report

(Continued from page 4)

chairman of the Power Subcommittee, fossil system maintenance expenses have increased less than those of other utilities at the same time that fossil system reliability has improved.

One of the most generally accepted measures of efficiency of a coal-fired generating station is the overall plant or system heat rate, which is defined as the number of British thermal units (BTUs) required to produce a kilowatt-hour of electricity. As is indicated in the attached chart entitled "Fossil Comparison Group," TVA in 1986 ranked above some of its neighboring utilities, including that of Virginia Power whose president was the principal author of the subcommittee report.

As for the allegation that "TVA has not decided that increased emphasis on fossil system improvement is required," the report ignores the significant efforts TVA has had underway in its Fossil and Hydro Unit Evaluation and Modernization Program, about which information was furnished the subcommittee chairman.

3. **Subcommittee report, p. III-28:** "In 1986, however, instead of being a hot seller, TVA imported large blocks of economy and nonreplacement energy to help meet its peak load."

Comment: TVA states that it was able to meet its load with its own generating resources for 99.14 percent of the time during 1986. It imported large blocks of power primarily because at times resources were available at lower rates from neighboring utilities. In purchasing such power TVA was following a practice commonly used by all utilities.

4. **Subcommittee report, p. III-30:** "In 1986, with all nuclear stations out of service, TVA was able to generate only 89 percent of the energy its customers needed."

Comment: As indicated above, TVA was able to meet its customers' needs with its own resources for 99.14 percent of the time during 1986.

5. **Subcommittee report, p. III-32:** "The utilization factor on the fossil system was in the 44-48 percent range from 1982 to 1985 and rose to 55 percent in 1986. A 62.5 percent factor in 1986 would have produced enough additional generation to have eliminated the need for purchase and interchange power. Given the load characteristics of the TVA system, a 62.5 percent fossil system utilization factor is not an unreasonable expectation had the system been in good condition."

Comment: The paragraph quoted above implies that TVA could not have maintained a 62.5 percent utilization factor of its fossil system in 1986 because the system was not in good condition. The fact is that TVA could have maintained this level of utilization, but chose not to do so because it followed the practice of all utilities in purchasing lower cost power that was available at the time from other utilities, as noted above.

6. **Subcommittee report, p. III-34:** Using assumptions, some of which are dubious, the subcommittee report, in Table 15, purports to show that "TVA will require significant power imports for some time to meet seasonal peak loads."

Comment: There is no table of estimated loads and resources which would substantiate the conclusion reached by the subcommittee report. During the recent period when all of TVA's nuclear plants were out of service, TVA, as indicated above, was able to meet its load with its own generating resources for 99.14 percent of the time. Even under the subcommittee report's most pessimistic assumption, that the Sequoyah 2 unit will go back in service in the spring of 1988, it is difficult to believe that TVA will not be able to meet its customers' demands with its own resources for virtually all of the time, should it choose to do so.

7. **Subcommittee report, p. III-38:** "Since the factors that contributed to the rate rise continue to exist, TVA rates can be expected to continue to rise faster than the national average."

Comment: Some of the factors that contributed to TVA's recent rate increases—such as a high rate of inflation, a major construction program of a number of nuclear power plants, and cancellation of eight nuclear plants—are not expected to continue. TVA's rates are expected to rise in the future, but the subcommittee report shows no projections of anticipated increases by other utilities or in the national average. Consequently, there is no substantiation in the report for the statement that "TVA rates can be expected to continue to rise faster than the national average."

Rates

(Continued from page 8)

tomers, the prices must be set above the actual costs the customers using these various innovative rates place on the system.

TVA's incremental energy costs establish a base beneath which innovative electricity rates cannot fall. Both LIP and ESP rates cover TVA's costs and provide additional revenue to defray TVA's fixed costs for other ratepayers.

Market-based rates should be targeted as much as possible to attract new electric customers or to retain those in danger of being lured away by competitive fuels or to alternative industrial sites outside the Valley area. However, this targeting must be sensitive to the risk of revenue erosion and avoid discriminatory application.

Market-based rates must provide adequate coverage of all costs of service and any pressures that growth in electrical usage may place on the local distribution systems. Effective marketing to increase the use of electricity must be done primarily by and through local power distributors.

As the energy market has developed more competitive dimensions, distributors have suggested ideas to market electricity including:

Educating large energy users about firm power rates and how market-based rates can be used to lower their overall energy costs.

Provide more rate flexibility for distributors. Many distributors want more flexibility to fit retail rates to match their system costs and to select from a rate "toolbox" those pricing arrangements that will fit their marketing opportunities, particularly to industrial customers.

Modify the residential rates structure. Some suggest that it may be time to consider restructuring the residential hydro preference to be more consistent with today's marketing needs.

TACKLING PART A RATES

Solving the commercial sales dilemma shouldn't create problems. The solution will be tricky.

By Barbara Haskew

No rate issue in recent months has generated more heat and less light than the "Part-A Problem." The poor performance of retail rates for a number of TVPPA municipal systems has fostered misunderstanding and ill-founded charges of a conspiracy to force mergers of TVA distribution systems. Solutions to the problem require a better understanding of the "Part-A" rate structure and some creative contributions from those responsible for ratemaking.

The problem occurs when large loads with Part-A rates cost more for the TVPPA distributor to serve than TVA's retail rates allow to be recovered from the customers. The distributor caught in this squeeze may serve several large "Part-A" loads at low margins or at a loss.

The problem is caused by the incomplete passthrough of TVA's wholesale demand charge to the retail customer and is most likely to occur on distribution systems where the sales mix is so heavily weighted toward general power (Part-A) loads that these loads often drive the distributor's monthly billing peak.

TVA's retail rates are designed to reflect the characteristics of the average TVPPA system and work well for municipal and cooperative systems that approximate these characteristics. The system's mix of residential and general power sales is particularly important in predicting how well the rates will serve a particular system. Large municipal systems like Nashville and smaller systems such as Russellville, Alabama, have sales mixes that are 40 to 45 percent residential. On these systems the residential and general power customer loads jointly establish the distributor's peak and the rates generally work as planned. On these systems, large "Part-A" loads as a group are usually only 78 to 80 percent coincident with the distributor's billing peak. (This simply means that only 78 to 80 percent of the demands on which the customer is billed actually contribute cost to the distributor's billing peak.)

However, for municipal systems where general power sales equal or exceed 60 percent of the total system sales these industrial and commercial loads are often the main cause of the distributor's peak and the large "Part-A" load contribution is higher than that provided for in the rate design.

The poor performance of retail rates for a number of municipal systems has fostered ill-founded charges of a conspiracy to force mergers of distribution systems.

For systems like Covington, TN (25 percent residential and 75 percent general power) the coincidence of the large "Part-A" loads as a group with the system's peak may exceed 92 percent; systems in this squeeze opt for higher rate levels to provide a more adequate recovery of the wholesale demand cost. Even then, much of the system's margin is largely produced from other customer groups - such as residential.

For Bowling Green, KY (31 percent residential and 69 percent general power sales) it is likely that almost all system margin is produced by residential sales. This pattern raises questions about the equity of such subsidization and the stability of system margin which is so dependent on weather-sensitive residential use. Although some subsidization among customers and customer groups is expected in ratemaking, the magnitude of this subsidization on these systems may suggest changes to diminish it.

Some distributors caught in the Part-A malady have argued that moving to a higher rate level to find more cost recovery from large "Part-A" customers results in the distribution system losing its competitive edge in attracting and retaining industrial loads-particularly those in the one to five MW range. Accordingly, they are reluctant to move up the rate levels. Some municipal managers worry that these pressures may force them, over time, to merge with surrounding cooperatives to improve the sales mix and allow for a more competitive rate.

Faced with these problems, what solutions might be considered?

1. Lower the wholesale KW charge.

This won't eliminate the problem but would minimize its impact on distributor margin for affected systems. However, shifting wholesale cost collection from the demand charge to other wholesale rate components will raise wholesale bills for higher load factor distributors and would raise bills for customers with higher load factors on all distribution systems.

2. Bill wholesale customers (distributors) with some consideration of their system's contribution to TVA's monthly peak.

This approach would largely eliminate the "Part-A" problem. Other rate factors being equal, the wholesale demand charge would increase slightly (approximately 40 cents) but retail customer rates and bills would remain largely unchanged. The wholesale rates would simply fit better and work more efficiently. This idea is somewhat revolutionary and some distributors are concerned that it might be more weather-sensitive than the current billing approach. I think further analysis will prove this untrue, but this notion needs more testing on all distributors

---

Barbara Haskew, Ph.D., is Dean, School of Business, Middle Tennessee State University. For eight years she served as Manager, Rate Design, Tennessee Valley Authority.

over an extended period of time before it is proposed for implementation.

3. Provide a coincidence correction credit or adjustment to the wholesale bill for affected distributors.

This approach would permit distributors with the "Part-A" problem to submit time-differentiated data to show the coincidence mismatch between their systems and the retail rate design. The power bill would be credited by an amount equal to the wholesale demand charge times the difference between the actual coincidence of the general power customers (1 to 5 mw as a group) and the coincidence built into the "Part-A" retail rates. Simply put, this credit would provide a complete, correct passthrough of the wholesale demand charge. Funding the coincidence correction credit for distributors with the "Part-A" problem would raise the demand charge for all distributors by 2 to 5 cents. Customer bills would be largely unaffected.

4. Divide the General-Power Part-A Class into several smaller rate classes.

Multiple rate classes would permit distributors to adjust their rate levels to match the cost the different groups of customers place on their systems. However, many distributors would be reluctant to exercise this option since it would raise customers' rates and bills and perhaps place them at a competitive disadvantage with neighboring distributor systems.

5. Encourage large loads which cause "Part-A" problems for their distribution system to convert part of their load to Economy Surplus Power (ESP).

While such conversions would provide margin assurance to the distributor and may lower the customer's bill, it would also subject the customer to some uncertainty about the availability of the power needed for operations. Further, use of ESP, if widely adopted by distributors to solve their "Part-A" problems, would result in revenue erosion for TVA and increases in the wholesale demand charge.

6. Increase the retail demand charges for the "Part-A" customers.

This would ease the margin squeeze for distributors experiencing the "Part-A" problem, but would diminish the cost basis of the rates for most systems and also raise customers' rates. Setting the rates high enough to avoid problems for a few distributors worked in the 70's but is a less attractive solution in today's competitive world.

7. Permit distributors to design their own rate levels.

This idea would custom-fit the rates to the costs on each distribution system. While the idea has great appeal for a number of reasons, employing this approach to solve the "Part-A" problem could produce higher customer rates on the very distribution systems that are now reluctant to move up the rate levels to address their margin squeeze. Distributors could get much the same result by taking advantage of the additional flexibility TVA recently provided which allows distributors impacted by this problem to split their residential and commercial rates more than one level apart. To date, few distributors have considered implementing such splits - probably because they don't want to raise rates for their "Part-A" industrial loads and diminish their competitive position.

This is a difficult problem. Basic to its solution are important decisions about how the cost of fixing it will be borne. Should the cost be borne by the impacted systems alone, or by all of the power distributors?

The choice of a solution will require resourcefulness from all those involved in the rate setting process. ☐

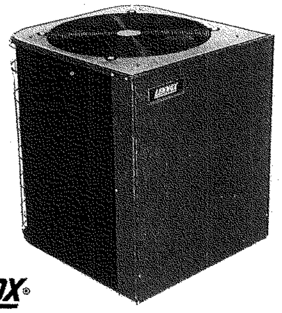
A BETTER HEAT PUMP

Boost Your Margin! Guarantee Customer Satisfaction with the Quiet Comfort, Outstanding Economy and Long-lasting Durability of the

Lennox HP19 Heat Pump

Your customers can enjoy year-round heating and cooling comfort with an affordable, high-efficiency Lennox HP19 heat pump system. Economical, dependable performance makes it the perfect heat pump for today's energy-conscious homeowners.

- 10 Year Limited Compressor Warranty
- Whisper-Quiet Operation
- Upflow, Downflow and Horizontal Applications
- High Efficiency Ratings:
  Cooling SEERs up to 12.00
  Heating COPs up to 3.42
  Heating HSPFs up to 8.30



LENNOX®

Quality Proven Over Time

For the Lennox Dealer in Your Area, Consult Your Local Yellow Pages.

RATE AGENDA FOR THE FUTURE

Before distributor
marketing efforts can succeed,
retail rates must be revised.

By Barbara Haskew

Over the last year, I've discussed a variety of rate issues and concerns with many TVPPA power distributors. From those discussions, I have developed an agenda of rate modifications and changes that could improve the effects the rate structures have on individual distribution systems and support efforts to market electricity. A brief explanation of these ideas may be useful to distributors as future rate changes are considered.

Cap the Preference Value

Currently, the preference benefits are worth about $340 million. These benefits, enjoyed by residential customers, are largely subsidized by distributor-served commercial and industrial customers. As competition for these customers and the jobs they provide becomes more intense, the wisdom of permitting the residential preference value to increase without a cap must be reconsidered. Capping the residential preference value would not only make the region's industrial rates more competitive, it would also permit the retail rate structures to more accurately reflect the cost of serving the several customer classes. Capping the residential preference at its current level would leave current residential customers' bills largely unaffected. However, over time the amount of subsidy received by individual residential customers would gradually diminish as the capped amount was spread over more residential customers and usage. All other rate factors remaining constant, such reductions would lead to very small annual increases in residential bills; commercial and industrial customers would see corresponding bill decreases.

Barbara Haskew, Ph.D., is Dean, School of Business, Middle Tennessee State University. For eight years she served as Manager, Rate Design, Tennessee Valley Authority.

Revise the Provision of the Preference in the Residential Rate

To support distributor marketing efforts to retain and expand electricity's share of the space heating load, preference benefits should be used to produce a flat or declining block rate structure for residential customers. The current "inverted" rate structure, implemented in 1983, was designed to encourage conservation. It sends residential customers a signal to limit their usage. Such a signal does not make marketing sense, particularly when distributors face expanding and aggressive competition from gas suppliers. To keep distributors whole, the revised preference in the retail rate design must be matched in Adjustment 4 of TVA's wholesale rate. Further, the customer and usage data used to calculate wholesale credits for preference power should be reviewed on a quarterly basis as is the case for calculating the wholesale debit amount for nonresidential power sales.

> ***The wisdom of permitting the residential preference value to increase without a cap must be reconsidered.***

Improve Distribution Cost Recovery and Customer Equity

In addition to the customer charge, the current residential rate recovers distribution cost equally in each kilowatt-hour used. The electric heating customer therefore pays a greater share of the distribution facilities' cost than the gas heating customer. Since distributors generally size facilities to meet the expected air conditioning load, this cost recovery is somewhat inequitable. Further, if killowatt-hour sales do not develop as expected, either because of weather variations or because customers choose other heating sources, the distributor may find that revenues from residential loads fall short of recovering all distribution expenses. Providing more distribution cost coverage in the customer charge and in earlier kilowatt-hour usage (particularly in the winter) would not only stabilize distributor cost recovery but improve retail customer equity as well.

These rate suggestions could produce a retail residential rate structure similar to the illustration in Figure A. Distribution cost recovery and some

Suggested Retail Residential Rate Structure

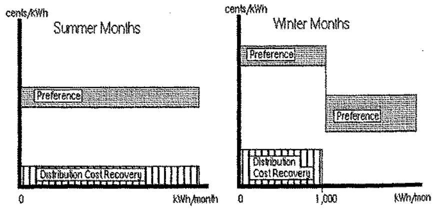


Figure A

The current rate structure was designed to encourage conservation.

preference benefits would continue to be provided in the customer or access charge. In the summer, the proposed residential rate would be essentially flat with both distribution cost recovery and preference benefits collected and provided in the kilowatt-hour charge. In winter, however, the rate would recover distribution cost more heavily in an initial 1000 kilowatt-hour block each month. Preference credits would be allocated to provide a more competitive declining block in winter, thus making electricity more competitive for the residential space heating load.

The proposed residential rate would recognize the competitive realities distributors currently face. Residential customers outside the TVA service area pay more for electric access and the basic lighting load than the current rate charged TVPPA distributor residential customers. This basic portion of the residential load is largely price-insensitive and distributors currently face virtually no competition for it. Air conditioning load is also largely captive since price competitive technologies are not currently available. However, the continued expansion of air conditioning among residential customers as population and personal income increases can be aided by the more attractive price a flat residential rate might provide.

The price of gas for space heating varies considerably across the valley, but a winter tailblock on the residential rate set at 4.5 to 4.8 cents could allow distributors to compete more effectively. For distributors who operate both electricity and gas systems, the revised residential rate would permit them to offer customers a more meaningful choice between heating sources and provide a collection of distribution system expenses that more accurately reflects the costs of providing service to residential loads.

Such changes would not be without some pain to both the distributor and residential customers. Smaller customers would see bill increases; larger users would receive bill decreases. The size of the customer charge, reflecting both its use as a vehicle for distribution cost recovery and as a mechanism for the delivery of preference benefits, would largely govern the amount of pain. The higher the proposed customer charge compared to what the customer pays today, the more pronounced the bill effect on the small user. A similar result occurs when additional distribution costs are added to the initial kilowatt-hour block or when preference benefits are shifted to support the development of a declining block in winter. Such bill impacts could cause particular concern in communities that have large numbers of low-income, low kwh users. Such considerations may mean the proposed residential rate structure must include a more moderate re-allocation of the preference benefits and a gentler declining block design than competition concerns alone would support.□

Editor's Note: The next issue of TVPPA News will include a discussion of the General Power Part A problem.

Southeastern Testing Laboratory, Inc.

HWY. 441 S.
POST OFFICE BOX 96
BISHOP, GEORGIA 30621

Office Phone
404-769-6645

TESTING FOR SAFETY

WE TEST

Rubber Gloves	Hot Line Tools
Blankets	Transformer Oil
Line Hose	Aerial Buckets
Insulator Hoods	Underground Cable
Hot Line Jumpers	Hot Sticks
Safety Hats	

WE REPAIR

Hot Sticks and	Chain Hoist
Other Hot	Extendo Sticks
Line Tools	Bucket Liners
Cable Hoist	Strap Hoist

WE SELL

New Gloves, Blankets, Line Hose
and Other Rubber Goods.
Ground-Ins-Cable Jumpers,
First Aid Supplies, Hot Line Tools, etc.

Acoustic Emission Now Available

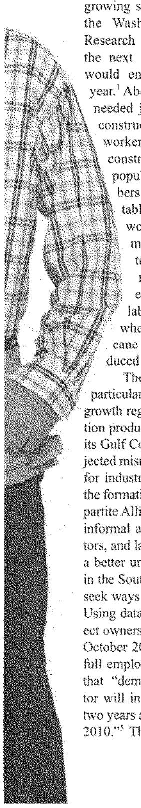
SOUTHEASTERN MANPOW

A collaboration to produce an adequate construction craft labor force

StockDisc

VER TRIPARTITE ALLIANCE

by Barbara S. Haskew



The nation and the Southeast face a major shortage of the construction craft labor necessary to undertake major power generation and industrial projects over the next 10 years. This looming shortage reflects both projected economic growth and its mismatch with a stagnant and slow-growing supply of skilled craft labor. In 2005 the Washington-based Construction Labor Research Council (CLRC) estimated that over the next decade 185,000 new craft workers would enter the construction industry each year.[1] About half of this annual number will be needed just to replace retiring baby boomer construction workers; the remaining craft workers are required to address increased construction demands fueled by projected population and economic growth. Members of the Construction Users Roundtable (CURT) classify the construction workforce shortage as critical and estimate the "industry must recruit 200,000 to 250,000 new craft workers a year to meet future needs."[2] CURT's higher estimates recognize that the existing labor shortage escalated to crisis level when the demands produced by Hurricane Katrina were added to those produced by a recovering economy.[3]

The projected shortage in the Southeast is particularly compelling both because it is a high growth region and because the massive devastation produced by Katrina and other storms is on its Gulf Coast. Growing concerns about the projected mismatch between the supply and demand for industrial craft labor in this region initiated the formation of the Southeastern Manpower Tripartite Alliance (SEMTA) in 2005. SEMTA is an informal alliance of industrial owners, contractors, and labor organizations "formed to develop a better understanding of the craft labor market in the Southeast United States and cooperatively seek ways to mitigate risks of labor shortages."[4] Using data provided by a sample of major project owners in the region, the CLRC estimated in October 2006 that craft labor was close to or at full employment in the Southeast and projected that "demand in the industrial construction sector will increase by 25 percent during the next two years and remain at that higher level through 2010."[5] The CLRC predicted that demands for several of the construction crafts—painters, ironworkers, pipefitters, and insulators—would increase by more than 40 percent during this same period.[6]

Power generation companies in the region such as Southern Company and the Tennessee Valley Authority (TVA) are actively involved with SEMTA because the projected labor shortage has clear implications for their operation and maintenance needs, the installation of environmental controls, and the construction of new generation capacity. Some of these projects are imminent. In mid-February TVA announced that over the next five years it plans to spend more than $1.2 billion on pollution control devices designed to address sulfur dioxide, nitrogen oxide, and mercury emissions at its eastern coal-fired plants.[7] Approximately 350 construction workers will be required to install the scrubbers and selective noncatalytic reduction systems designed to produce cleaner air in the Great Smoky Mountains.[8] Power companies in the Southeast are also planning both new coal-fired and nuclear generation capacity to address the anticipated economic expansion of the region. Construction of new capacity could begin as early as 2010. One report notes that power companies across the nation "are pursuing licenses for more than 30 nuclear plants and plan to site most of them in the Southeast."[9] Additional nuclear capacity could further stress the impending labor shortage since craft labor will also be required to support the refueling and maintenance outages at nuclear plants.[10]

SEMTA is working through four subcommittees to probe the dimensions of the labor shortage in the region and develop possible strategies to address it. These subcommittees are focused on the following areas:

- Critical Needs Assessment,
- Identifying the Impact of Hurricane Katrina,
- Demand Leveling, and
- Recruitment and Workforce Development.

The vice president for technical services at Southern Company indicated that "by 2010, when peak labor demand is projected, demand for trades workers is expected to more than triple on new power generation projects and

continued on page 26

continued on page 27

New workers are needed in all the crafts, but critical shortages are projected for boilermakers, electricians, insulators, ironworkers, and pipefitters.

nearly double on petrochemical and LNG (liquefied natural gas) projects."[11] New workers are needed in all the crafts, but critical shortages are projected for boilermakers, electricians, insulators, ironworkers, and pipefitters. Another subcommittee is focused on estimating the impacts of Hurricane Katrina. The results of their five-year hurricane recovery labor forecast indicate the demand for approximately 10,000 craft workers in 2007 will grow to over 40,000 by 2011.[12] These workers will be needed for debris clean-up, for rebuilding the levee system, and for repairing and rebuilding the housing stock in Louisiana and Mississippi. Industry analysts note the impacts of Katrina include "the loss of experienced journeymen to demolition and cleanup crews for premium wages, extreme recruitment incentives to come to the area, recruitment of foreign nationals to supplement crews, widespread wage increases, and higher overtime costs, bids, and budgets."[13]

Eddie Clayton, outage manager for Southern Company, noted that SEMTA's subcommittees "are beginning to identify opportunities that could help narrow the gap between the supply and demand for craft labor in the Southeast." One opportunity is demand leveling. This approach uses shared information about industrial project schedules to identify and explore opportunities to shave labor demand for critical crafts during peak periods. For example, power generation companies in Kentucky and Tennessee are planning major projects using craft labor in the fourth quarter of 2007. New power generation projects are planned in Florida for the second quarter of 2008. Knowing the demands these projects will place on the craft labor supply will permit the companies to integrate their plans for use of craft labor and minimize the impacts of shortages. Demand leveling also considers the expanded use of new technologies such as modularization and improved supply chain processes. Such approaches are consistent with recommendations of the Lean Construction Institute, which argues that "a shift in how projects are designed, carried out, and delivered can and will benefit the industry and the labor shortage."[14] Jerry Payton, senior manager of TVA Industrial Relations, explains that benefits from participating in SEMTA include "better utilization of existing construction craft labor though demand leveling, improved scheduling of projects with more information about the availability of craft labor, and increased utilization of apprentices and nonjourneymen (to grow a future labor force)."

Craft unions represent approximately 45 percent of the region's industrial craft workers. In addition to training craft workers, the unions are partnering with contractors to increase productivity through improving employee efficiency and performance on the job. For example, the Code of Excellence promoted by the IBEW is designed to decrease absenteeism and lower job-related accidents.[15] An alliance of boilermakers, industry contractors, and owners celebrates their joint efforts, which have raised worker productivity over a 20-year period.[16] But the improved scheduling and increased productivity of the existing construction craft labor supply cannot fully address the magnitude of the labor supply problem. Declining or stagnant numbers in apprenticeship and other training programs clearly signal that young craft workers in the pipeline in this region are insufficient to replace the massive number of "baby boomer" retirees expected over the next 10 years.

While rising wages for craft labor will attract additional workers to the Southeast from other markets, such increases would need to be substantial to attract significant numbers of trained workers since wages in other regions are measurably higher for many construction crafts. According to a recent publication, the average California construction worker earns about $24 an hour, and journeymen workers earn up to $70,000 annually.[17] Lower construction wages in the Southeast may reflect the significant concentration of Hispanic workers in the industry.[18] These workers are often unskilled and undereducated. Many are undocumented. Even after controlling for work experience and years of schooling, one study found "Hispanic laborers and carpenters are paid a lower hourly wage than their non-Hispanic counterparts in the Southern and Western states."[19] The study emphasizes "the construction industry needs to develop safety and skills training for this growing community" and concludes education and training are important if this growing segment of the construction labor force is to contribute to "the adoption of new technology and workforce strategies."[20] Another analysis notes "both contractors and owners . . . need to dramatically increase their efforts in immigration-compliant hiring processes," and "extensive bilingual training (both in safety and the specific trade)" while "educating themselves in the language and cultures of their labor to communicate effectively."[21]

SEMTA is aggressively considering a multitude of approaches to develop a larger construction craft labor force within the region. These plans include encouraging high school graduates to enter construction crafts, recruiting returning military through the Helmets to Hardhats program, and encouraging new diversity and recruitment initiatives to attract more women and Hispanic immigrants into the craft apprenticeship programs. A recent survey of companies/owners of construction projects identified the labor shortage as a major concern and suggested more

> aggressive measures to retain, recruit, and otherwise make careers in the construction industry more attractive to the upcoming generation. Increasing pay scales and importing labor from outside of our borders are only temporary solutions. In the end, the industry will need to increase productivity and work to compete with the alternative careers available to the next generation.[22]

Unions and contractors are also exploring approaches that could provide more continuous employment/earnings opportunities for craft workers and particularly for apprentices. Some unions are assessing and crediting the experience of new entrants to provide for faster advancement in their apprenticeship programs. As it focuses on bringing young workers into the construction industry, SEMTA is aware it must wrestle with an image problem. Since the advent of the knowledge economy, parents and educational leaders have focused on encouraging students to seek four-year college degrees and white-collar jobs. Construction jobs are viewed as dirty, dull, and dangerous, dead-end careers characterized more by grime than glamour. To change that image will require partnering with the educational system at all levels and a multitude of community groups. The message must be clear and sufficiently persistent to influence the career choices of high school and community college students. Continued support from both federal and state governments in resources and rhetoric can provide the continuity to support the development of a trained professional construction labor force.

The cooperative efforts of owners, contractors, and unions in SEMTA are not without stresses. Owners walk a fine line in sharing information and engaging in collaborative efforts but are careful not to enter into activities that might violate antitrust provisions. Some contractors and owners are anxious to preserve and support open-shop labor while simultaneously working closely with unions to improve training and expand the skilled-labor supply. Craft unions are interested in improving opportunities and earnings for members and increasing regional membership. For all parties the future of U.S. immigration policy remains a major wildcard. But each partner in the alliance is enthusiastically committed to increasing and improving the construction craft labor force in this region. Failure to effectively address this imminent shortage can escalate construction costs, postpone projects, and potentially produce a power shortage. The success of SEMTA in addressing the labor shortage may minimize or avoid these problems and collaboratively produce byproducts that will improve the industry, increase the skills and earnings of the regional workforce, and impact economic development in Tennessee and the Southeast. ■

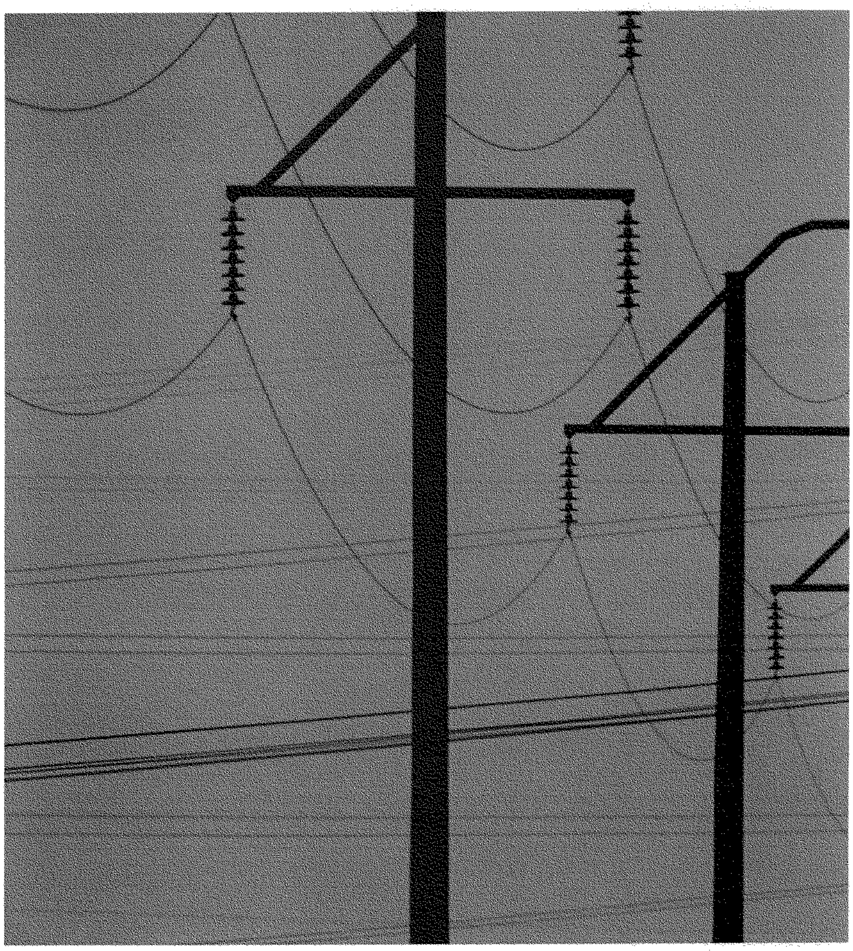
Unions and contractors are also exploring approaches that could provide more continuous employment/earnings opportunities for craft workers and particularly for apprentices.

Barbara Haskew is a professor of economics at MTSU and director of the Tennessee Center for Labor-Management Relations.

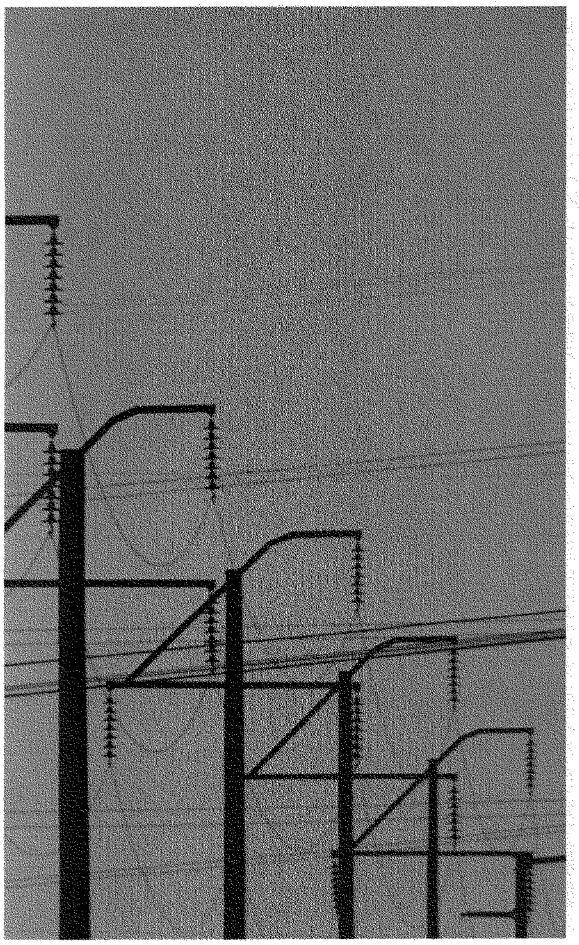
Endnotes

1. *Craft Labor Supply Outlook 2005–2015.* Construction Labor Research Council, Washington, D.C.
2. "Workforce Crisis, Exploring Industry Solutions," *The Voice*, Construction Users Roundtable 2006/2007 (Winter): 18.
3. Ibid.
4. *Projected Demand for Craft Labor Southeast United States 2006–2010.* Construction Labor Research Council, Washington. D.C., presentation to a meeting of SEMTA in Charleston, S.C., October 4, 2006.
5. Ibid.
6. Ibid.
7. Dave Flessner, February 15, 2007, "TVA Plans Scrubbers for Sevier Coal Plant," *Chattanooga Times Free Press* 138 (63): A1, A5.
8. Ibid., p. 5.
9. "Keeping Current for Members of Energy Northwest," October 2006, p. 6.
10. Ibid.
11. Brian Lockett, "2010 Will Test Southeast Labor Supplies According to Data from SEMTA Coalition," *Construction Labor Report* 52 (2590), September 27, 2006.
12. Tim Horst, Jim Williams, Kermit D. Jones, and Carol Gould, "Hurricane Katrina and Rita Impacts on the Gulf Coast," presentation to SEMTA, Charleston, South Carolina, October 4, 2006.
13. "Workforce Crisis, Exploring Industry Solutions," op. cit. p. 19.
14. Ibid., p. 19.
15. Jim Springfield, International Brotherhood of Electrical Workers (IBEW), presentation to the Winter Tennessee Labor Management Conference, Chattanooga, March 1, 2007.
16. "Boilermakers Sponsor 20th Annual Tripartite Conference," *Boilermaker Reporter* 44 (5), November/December, 2005.
17. "Construction Industry Braces for Long-Term Labor Shortage," *Sacramento Business Journal*, April 26, 2004.
18. Paul M. Goodrum, 2004, "Hispanic and Non-Hispanic Wage Differentials: Implications for United States Construction Industry," *Journal of Construction Engineering and Management* (July/August): 552–559, at p. 558.
19. Ibid. p. 558.
20. Ibid. p. 558.
21. Arthur Heimbach, Sabine Hoover, Nick Schubert, and Nick Hier, 2006, "Perspectives on Future Construction Labor Shortages," FMI Quarterly 2: 44.
22. "$C^3 + 2C = LC$," *FMI/CMAA. Seventh Annual Survey of Owners*, p. 14.

ELECTRICITY DEREGULATION



— WHAT, WHY, AND HOW



What's all this talk about "deregulation"?

by Barbara S. Haskew and Reuben Kyle

Almost daily for the past year, there have been news stories about California's nightmare of rolling blackouts, astronomical electric bills, and the virtual bankruptcy of its power distributors. The word that has become associated with these terrible problems is *deregulation*. The objective of this article is to give the reader some background on the deregulation of the electricity industry in the U.S. We discuss the history of the electricity industry, the rise of regulation, the motivation for deregulation, the transition to deregulation around the country, and the unique problems that face Tennessee.

Beginning in 1978 with the Airline Deregulation Act, the United States started to dismantle the regulatory structure of many industries. After more than 40 years of developing national mechanisms to regulate airlines, banking, broadcasting, intercity buses, electricity, household goods moving, natural gas, railroads, telephones, and trucking, the U.S. made a dramatic reversal of policy. During the intervening 20-plus years, the U.S. has eliminated many layers of economic regulation that had placed these industries in separate boxes with strict government overseers.[1]

The latest industry to feel the forces of deregulation is electricity. For most of the 20th century, one company generated the electricity, transported it from the generation facility to the local retailer, and distributed it over a local grid to our homes and businesses. These vertically integrated monopolists operated in prescribed geographic areas subject to state and federal regulation. One result is that today the price of electricity varies from under four cents per kilowatt-hour in Idaho to more

continued on page 4

continued from page 3

than 12 cents in Hawaii. These price differentials are the motivation behind the deregulation movement.

Electricity consumers in California, Pennsylvania, and a few other states are already able to choose their own electricity providers. Just as with long-distance telephone service, electricity consumers will choose their electricity supplier. Consumers may do business with whichever utility offers electricity in their community—American Electric Power from the Midwest, Georgia Power, or a provider located in eastern Canada.

> **It is entirely possible that Tennessee residential electricity consumers could see a rise in their rates under deregulation.**

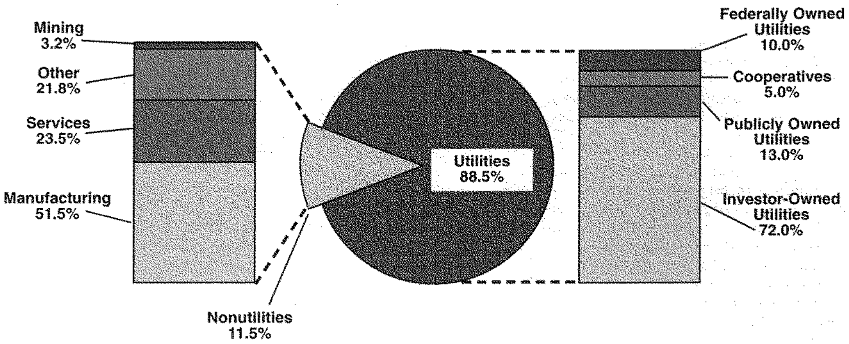
When you flip the light switch in your kitchen, the electricity will still travel over the same lines that now deliver power from your local electricity distributor. Local organizations will likely continue to provide and service those lines, but the electricity distributed by their grids could come from providers all over the continent rather than exclusively from the Tennessee Valley Authority (TVA).

A Brief History of the Electricity Industry

Electricity became commercially available when Thomas Edison opened the first generation plant in 1882 in New York City.[2] At the end of the 19th and beginning of the 20th centuries, the growth of the electricity industry was as dramatic and revolutionary as the information technology age has been in the past two decades. Initially, the industry was characterized by numerous private generation facilities competing for customers in close proximity to the plant. By the end of the 1800s, increasingly larger plants with newer technology were able to produce electricity at lower costs per kilowatt-hour, exploiting a phenomenon known as economies of scale.[3]

U.S. public policy evolved to favor either the municipal ownership of electricity producers or the regulation by states of privately owned producers. The Public Utility Holding Company Act (PUHCA) of 1935 limited the operations of electric companies geographically and in their financial structure. Along with the Federal

Share of Total Industry Capability by Industry Sector and Ownership, as of January 1, 1999



Source: U.S. Department of Energy, Energy Information Administration, "Electric Power Annual 1999" (Published August 2000)
http://www.eia.doe.gov/cneaf/electricity/epav1/fig2.html

Power Act of the same year, the PUHCA led to restructuring of the industry and the creation of a combined state and federal regulatory structure that still exists. The figure below gives electric generation capacity by sector and by ownership. It indicates investor-owned public utilities provide electric power for most Americans.

After energy prices increased by more than 500 percent in the 1970s, policymakers looked for anything that might provide consumers some relief. One result was the Public Utilities Regulatory Policy Act (PURPA) of 1978. The intention of the act was to encourage efficiency and innovation including the development of new independent producers. Next came the Energy Policy Act of 1992, which specifically created a class of wholesale power producers exempt from federal regulation.

In the mid-1990s the Federal Energy Regulatory Commission (FERC) issued rules that promoted competition in wholesale power markets and required integrated utilities to make their transmission lines available to other producers for a fee. These policy changes laid a foundation for the deregulation of electricity generation.

What Prompted Deregulation?

The deregulation of American industry was a product of the inflationary economic environment of the 1970s. For the most part it was not inspired by the businesses that were being regulated but rather came about when Congress was convinced that regulatory reform might reduce consumer prices. The changes began in the energy, transportation, and financial services industries and then spread to other parts of the economy.

Proponents of deregulation argue that it has benefited consumers in the form of lower prices and more choices. Estimates are that transportation deregulation alone benefits consumers by $50 billion per year. Some observers argue that the strong U.S. economy of the past two decades is a result of deregulation.[4] The FERC estimates that consumers may benefit to the tune of $20 billion per year from electricity deregulation.

Economists argue that deregulation and competition mean that prices are pushed closer to the cost of producing goods and services than in other market environments. Prices could fall if the regulated prices were higher than cost per unit, but prices could actually rise if regulated prices were below the cost of production. That circumstance has occurred in some part of just about every deregulated industry. It is entirely possible that Tennessee residential electricity consumers could see a rise in their rates. Under the current situation TVA sets rates by class of consumer—industrial, commercial, and residential—and its policy has favored residential users.

One important influence promoting deregulation in the electricity industry has been the development of new gas turbine generation technologies, making the old scale economies no longer applicable in the generation of electricity. This technological change together with the price differentials that large industrial electricity consumers see and experience across the country has been the main inspiration behind change.

What Would Deregulation Mean in Tennessee?

Despite the restructuring in other parts of the country, such efforts in Tennessee are moving at a much slower pace because most industrial, commercial, and residential customers in Tennessee are served either directly by TVA or distributors of TVA power. Because TVA is a government-owned corporation, its deregulation will require federal legislation. TVA and other interested groups are focused on the content of that legislation and how the utility and its customers can prepare now for competition.

TVA is the nation's largest utility and serves more than eight million customers.

This preparation is a major undertaking since TVA is the nation's largest utility and serves more than eight million customers. Despite its staggering debt, the nation's largest for a utility, TVA's rates are still acceptable or attractive for many of the retail customers. Residential rates are among the lowest in the nation. Commercial and industrial rates are more on a par with the Southeast and U.S. average. To Tennessee's north, Kentucky Utilities and American Electric Power offer lower rates, causing industrial customers in Kentucky to argue that TVA power rates place them at a competitive disadvantage.[5]

In 1997 TVA began serious preparation for deregulation by committing itself to a 10-year business plan designed to make it more competitive. The plan would cut TVA's $27 billion debt in half by 2007 and hold rates stable for 10 years. Unfortunately the plan is already off target. Although TVA has kept rates stable, analysts estimate its debt reduction will fall far

continued on page 6

continued from page 5

short of the plan by 2007. As of September 2001 the debt still topped $25 billion and the agency has announced plans to reduce it by only $50 million over the next 12 months.[6]

The debt is worrisome, both to constituencies in the valley and to other utilities in the region. The U.S. General Accounting Office, responding to senators Mitch McConnell of Kentucky and Bob Smith, then chair of the U.S. Senate Committee on Environment and Public Works, reports that "if TVA enters a competitive environment with relatively high debt service costs, its ability to price power competitively could be jeopardized, thus increasing its potential for stranded costs."[7]

Electricity usage in Tennessee is the highest per capita in the nation.

These possible stranded costs concern TVA's 158 power distributors, who fear being tied to power contracts that would saddle them with these costs if the agency fails to reduce its debt. TVA Exchange, a coalition of investor-owned neighboring utilities, also expresses concerns about TVA's massive debt and the impact it would have on the region. "If the balance sheet of one utility—especially one as big as TVA—is not under control, it can adversely impact the regional economy. TVA's cash flow, for example, could become so constricted that it may hinder TVA's ability to maintain a reliable power system, something that would certainly affect the Southeast power network."[8]

TVA contends that it modified its debt reduction schedule to address other pressing and unanticipated needs. "The 10-year plan is a living document that must respond to changes. We awoke to a real dilemma ... when we had really hot weather and we found we couldn't always rely on getting reliable power from others. With those uncertainties, we realized it made more sense to have some additional peaking capacity of our own."[9] To address this need TVA has added 3,500 megawatts of generating capacity since 1997 and in recent months focused on adding distributed peaking generation in the form of gas-fired combustion turbines.[10] The TVA Exchange objects to TVA's decision to add generation capacity, arguing that the region would be better served by TVA's focusing on debt reduction and energy conservation and letting TVA's distributors provide for some of their own needs.[11] Similar concerns are echoed by the Southern Alliance for Clean Energy, which decries TVA's encouragement of greater energy use and the decision to build more capacity to serve it. Pointing to recent statistics that indicate electricity usage in Tennessee is the highest per capita in the nation, the organization accuses TVA of failing to provide leadership to help its customers conserve and use electricity efficiently.[12]

Strengthening the transmission infrastructure is also a high priority for TVA because the utility wants to maintain and improve its reputation for reliability with its current customers. The valley's transmission system is under stress from the increased power flows resulting from deregulation. Deregulation both to the north and south has placed growing demands on TVA to move power from one utility to another across its service territory, but TVA's interconnections with other utilities were not designed to handle the volume of electricity that other utilities are now attempting to wheel across the system. Despite its record of reliability in providing electricity to its own customers, others in the industry and aggressive energy brokers see TVA as a bottleneck in the southeast and a barrier to effective deregulation.[13]

TVA and certain customers of its power may benefit from the slow progress of federal legislation that would deregulate TVA—progress made more uncertain by the California failures. Delays could provide increased time for TVA to address its generation and transmission issues and further refinance and reduce its debt at lower interest rates; provide an opportunity for the country and the industry to address and correct the deficiencies of the national grid; and, although investor-owned utilities in the southeast are moving toward deregulation willingly or unwillingly, allow TVA some protection from market forces during this interim period. Provisions of the 1992 Energy Policy Act exempt TVA from having to wheel power from other utilities to serve loads within TVA's service territory. Referred to as the "anti-cherry-picking" provision, this exemption effectively protects TVA from competition for its wholesale loads. Federal regulation is expected to eliminate this exemption and permit other utilities to compete for customers in TVA's service territory.

TVA, its power distributors, and its large industrial customers have developed a consensus on the provisions they would like to see in the federal legislation that will bring TVA into the competitive world of electric deregulation. This consensus, largely supported by congressmen from areas served from TVA power, is known as the "TVA Title."[14] Chief among these provisions is one that would remove the "fence" that generally prohibits TVA from forming contractual agreements to sell power outside the area served as of July 1, 1957.

The "title" would provide for the renegotiation of existing power supply contracts between TVA and its distributors.[15] It would also provide that TVA's transmission rates, terms, and conditions would be subject to FERC regulation and that its stranded cost recovery would be determined under FERC rules. The "title" would give up some of the exemption that TVA currently enjoys from the antitrust laws. Also, the proposed provisions would reduce TVA's regulatory role in the approval of retail rates offered by the power distributors. This latter provision may be of particular interest to residential customers, whose historically lower electric rates result, in part, from the allocation of TVA's hydropower to their use. It is not clear that the Tennessee Regulatory Authority would continue this special cost allocation.

The deregulation of the electric utility industry is underway. Its progress may be rocky, but if done correctly it "...can lower costs, improve reliability, encourage technological innovation and even promote conservation."[16] Done poorly it can produce crises such as that experienced in California.

Many questions remain about the timing and specifics of deregulation in both wholesale and retail markets. Generation capacity, viewed in short supply in January 2001, may well be awash in surplus by 2004.[17] It is not yet clear what costs new security measures associated with nuclear capacity may impose on TVA. The transmission system today is not prepared to handle the demands of a fully deregulated marketplace. It is not clear that many policymakers are prepared to complete the task by extending deregulation to retail customers and providing rates that more closely reflect the true costs of producing, moving, and using power. As these issues are addressed in Washington and in other states, Tennesseans should be alert to how the progress of deregulation will affect their lifestyles and pocketbooks. ■

Barbara S. Haskew, MTSU Provost and Vice President of Academic Affairs, served as TVA rates manager from 1980-88. Reuben Kyle is a professor of economics at MTSU.

TVA's interconnections with other utilities were not designed to handle the volume of electricity that other utilities are now attempting to wheel across the system.

Notes

1. Economists distinguish between economic and social regulation. Economic regulation is policy that supervises prices, the quantity and quality of output, entry and exit of providers, profits, and capital expenditures. Agencies such as the Civil Aeronautics Board and Interstate Commerce Commission, neither of which still exists, regulated airlines, interstate trucking, railroads, intercity bus service, and other transportation companies. Social regulation, on the other hand, deals with health, safety, and environmental issues. There has been much less reform regarding social regulation than economic regulation.

2. An excellent and convenient history of electricity and the electricity industry is available at the Smithsonian Institution's website, "Powering a Generation of Change." http://americanhistory.si.edu/csr/powering/index.htm

3. The expression *economies of scale* refers to the decline of per unit operating costs as the quantity of output increases when all of the resources used by the producer can be varied. The evidence indicates that economies of scale are frequently available in the production of goods and services but usually exhausted after some point. In a few industries these economies may continue over a very wide range of output. The result is termed *natural monopoly* because there is likely to be only one surviving producer in the market.

4. Robert Crandall and Jerry Ellig, *Economic Deregulation and Customer Choice: Lessons for the Electric Industry*, (Fairfax, VA: Center for Market Processes, 1997).

5. Dave Flessner, "TVA Plans to Make Upgrades to Plants" *Chattanooga Times Free Press*, September 20, 2001, pp. A2, 6.

6. Ibid.

7. United States General Accounting Office, "Report on TVA's Financial Condition," GAO-01-327, submitted to senators Bob Smith and Mitch McConnell, February 28, 2001, p. 5. Stranded costs are costs or investments that might not be recoverable in a competitive environment. An example would be an uncompleted nuclear power plant.

8. John Howes, "TVA Needs to Confront Problems, *Chattanooga Times Free Press*, June 3, 2001, pp. G1, G2.

9. Dave Flessner, "More Power Needs Cloud TVA Future," *Chattanooga Times Free Press*, August 8, 1999, p. A1.

10. While the addition of this capacity had required funds targeted for debt reduction, much of this investment has involved leaseback arrangements that add generation capacity without increasing TVA's debt.

11. Howes, *op cit.*, p. G2.

12. Dave Flessner, "Tennessee's Top Power Users," *Chattanooga Times Free Press*, September 5, 2001, pp. A1, A8.

13. The issues related to transmission are quite complex and deserve much more discussion than is offered here.

14. TVA Title, Fact Sheet, May 16, 2000.

15. B. J. Gatten, "The Power of Choice," *Inside TVA*, August 14, 2001, pp. 1, 3.

16. Peter Coy, "How To Do Regulation Right," *Business Week*, March 26, 2001, p. 112. The costs of producing power vary significantly around the clock. "[T]he true cost of running your dishwasher during peak demand may be 100 times higher than the cost at times of low demand" (p. 112). If some portion of customers shift more usage into the off-peak period, then the system will require less expensive generating capacity.

17. Edward H. Baker, "Balance of Power," *Fidelity Outlook*, August 2001, p. 8.

Environment and Public Works Committee Hearing

February 23, 2010

Follow-Up Questions for Written Submission

Questions for Barbara Haskew

Questions from Senator Barbara Boxer

1. The Government Accountability Office in 1995 said "TVA's troubled financial condition has been largely caused by construction delays, cost overruns, and operational shutdowns in its nuclear program."

   Do you commit to working to ensure that TVA does not repeat the mistakes of the past? Will you promote a transparent process to develop investment decisions and independent analysis of those decisions?

   I do commit to work to ensure that TVA does not repeat the mistakes of the past and I am committed to promoting and supporting a transparent process to develop investment decisions and independent analysis of these decisions should I be confirmed.

2. I am concerned that North Carolina had to sue TVA in an effort to get pollution controls put on some coal plants -- testimony that the state put on during trial estimated that TVA pollution has caused 1,400 hundred premature deaths a year and $8.4 billion in health costs. The Kingston, TN, cleanup is going to cost more than $1 billion to clean up.

   Do you agree that TVA should take into account the public health and environmental costs when it develops policies to promote low-cost power?

   Both the North Carolina lawsuit and the Kingston coal ash spill raise serious questions about the environmental impacts of the operations of TVA's coal plants and its stewardship of the region's environment. The costs of cleaning up the sulfur dioxide and nitrogen oxide emissions associated with producing power with coal as well as the risks associated with the management and disposal of waste products from these plants must be seen as part of the costs of generating power from fossil fuels. While the press reports that TVA has moved to reduce the polluting emissions from its coal plants on a more aggressive schedule than some of the nation's other utilities the progress was not rapid enough to address the health concerns of citizens in North Carolina. It appears that the bar is being raised and that meaningful environmental concerns may produce addition legal challenges, concerns from Congress and regulatory agencies and complaints from TVA's own stakeholders. In response to these it is my understanding that TVA has accelerated its schedule for placing scrubbers on its coal fired units and might consider moving to close down the John Sevier fossil plant, one of its oldest coal-fired plants and one source of the pollution complained of in the North Carolina lawsuit.

The unexpected fly ash spill at the Kingston plant also raised concerns about TVA's ability to safely manage the waste products produced by coal fired plants. The assessment of the spill by engineering consultants, regulatory officials and TVA's Inspector General identify possible flaws not only in the technical retention and storage of the fly ash but concerns about TVA's response to smaller spills and leaks and recommendations about modifying the ways in which the fly ash was handled. TVA has announced that it plans to end wet storage of ash at its coal plants, to put into place a safer system of dry fly ash retained in ways that will protect the environment and the population living close to the plant. TVA's CEO described these changes and the Authority's plans and commitments in his appearance before the EPW Committee in January 2009. These changes seem to be appropriate and reflect TVA's public commitment to have the "safest and most thoroughly inspected compounds in the industry."

I do agree that TVA should take into account the public health and environmental costs when it develops policies to promote low cost power. As additional information becomes available about the environmental and health impacts of producing power then TVA must consider the costs of addressing and managing these concerns and incorporate those costs into its evaluation of power generation sources.

3. If confirmed, do you agree to meet with EPW staff within the first month of your confirmation to discuss whether the TVA may ask Congress to raise the Authority's debt ceiling , and if so, the reasons for this requested increase?

If I am confirmed as a member of the Board of Directors of the Tennessee Valley Authority I will agree to meet with the EPW staff at your request to discuss the possible raising of TVA's debt limit. While I am not yet completely conversant with the full financial impacts associated with each of the issues currently facing TVA, addressing them may cause TVA to consider the possible raising of the debt limit with the Congress. If confirmed, I look forward to learning more about this issue from TVA management.

4. What new clean energy and energy efficiency policies would you encourage TVA to use if you were to help shape its next few years on the board? Would you be willing to product a report for this Committee that describes how those policies could be implemented?

TVA is currently developing an Integrated Resource Plan to address its future production of power. If confirmed I would want to consider the information utilized in that process and the options under consideration before producing such a report. TVA is considering adding baseload nuclear capacity and is also considering the development of additional renewable sources of power in the Valley. I believe both of these are good strategies. TVA continues to work closely with the 156 distributors of TVA power and their customers to develop programs and implement technologies that will promote conservation and the use of electricity both more efficiently and in ways that shape the load to minimize the costs associated with the production of power. I understand that discussions about rate issues that may support these programs are planned or underway with distributors and experimental time of use

rates utilizing smart grid technology are planned for implementation on the Chattanooga Electric Power Board system. Working closely with the power distributors is critical to encouraging conservation and load management since TVA doesn't serve any residential customers, or most commercial and industrial customers. Working effectively with the cooperative and municipal systems is important to developing conservation and shifting load to reduce TVA's power costs.

5. If confirmed, do you commit to ensure that health and safety issues associated with coal ash and other waste management concerns are fully addressed? And do you agree to provide a timeline in which problems identified to date will be addressed?

   If confirmed I commit to work with other members of the TVA Board and with TVA management to develop a responsive, meaningful and achievable timeline on which these issues and possible problems can be addressed. I believe that health and safety issues associated with the production of power must be an important commitment of TVA to both its employees and the ratepayers and citizens of the Valley.

Senator Thomas R. Carper

As Chairman of the Senate Subcommittee on Clean Air and Nuclear Safety, which oversees the Tennessee Valley Authority, I am happy to see us moving forward on the nomination process for Tennessee Valley Authority (TVA)'s Board of Directors.

1. As we all know, serious environmental problems have troubled TVA in recent years. As a government entity - the TVA should be a leader in our clean energy economy, not a laggard. Therefore, I believe that it is time we have a change in culture at the TVA. TVA needs a culture that treats public safety as the number one priority over public rates. A culture that is dedicated to leading the way in clean, efficient power generation in this country. As a nominee to the Board of Directors of TVA, how are you going to change the culture at TVA and what are some of your ideas on how TVA can be a leader in the clean energy economy, leading out nation towards a clean energy future?

   Senator Carper, in my interaction with the management of TVA since my nomination by the President I have been impressed by the Authority's increasing focus on improving the public safety and environmental impact of the power it produces. Some of this may be the result of the North Carolina lawsuit, of the TVA coal ash spill, of the increasing interest of ratepayers and stakeholders in cleaner and renewable sources of power, of discussions with your Committee and of expectations of increased government standards which may require greater attention to preservation of the environment and the health of the nation's citizens. I believe that TVA must move to steadily address these issues even in the midst of these difficult economic times. TVA is currently engaged in an Integrated Resource Planning process designed to develop a plan "that TVA can enact to achieve a sustainable future and meet the electricity needs of the Tennessee Valley over the next 20 years." TVA intends to implement the plan that meets both the goals of its Strategic Plan and its Environmental Policy. The TVA Board of Directors approved this Environmental Policy in 2008, noting that it "will inform TVA's Business decisions" as the Authority provides "clean, reliable, and still affordable energy, sustainable economic development and proactive environmental leadership." If confirmed I promise to support these commitments.

2. Due to understaffing and incidents like the fly ash incident, I have heard that morale among the TVA employees is very low. As a nominee to the Board of Directors of TVA, how will you boost employee morale and ensure we retain the best employees?

   I understand that TVA has already undertaken an agency-wide Initiative to transform TVA into a more accountable organization. A review of 6 key areas began in the Fall of 2009. Design, implementation planning and specific improvement programs of the Initiative are expected to continue throughout much of the current fiscal year.

From personal experience I know that TVA has a history of employing a very talented and proud labor force. Both its employees and its retirees are workhorses in their communities. No doubt many employees are distressed by the fly ash spill, the damage it caused and the image that it has created for the Authority. My management experience informs me that employees want to "own" their jobs, be provided the tools and training to perform effectively and produce a good product or service. They want to be proud of their work and of TVA. Employees also need to feel free to report/complain about processes that are not safe or create unsafe conditions for the Authority. In my work in labor relations I have seen extraordinary accomplishments in productivity and morale where unions and employees are given meaningful roles in jointly reaching goals. TVA has a long history of unionization of its workforce, much of it collaborative and I hope that such a joint effort can add to and support the effectiveness of the Initiative.

3. As you may know, Senator Alexander and I have introduced a bill to regulate fossil fuel power plant pollution to clean up our nation's air. Currently, TVA's power generation is still heavily dependent on coal. As a nominee to the Board of Directors of TVA, how do you think the TVA could do better in reducing sulfur dioxide and nitrogen oxide emissions?

   TVA could further reduce sulfur dioxide and nitrogen oxide emissions in the Valley by completing the installation of scrubbers and SCRs on its coal plants and by burning cleaner coal. Such emissions could also be reduced by substituting clean power production such as nuclear, solar, other non-polluting generation or conservation for coal.

4. In an October 2009 GAO study (GAO-1O-47- Mercury Control Technologies at Coal Fired Plants http://www.gao.gov/new.items/dl047.pdf, the GAO found that mercury technology is commercially available, can reduce mercury emission by 90 percent for all coal types, and has been installed on a majority of coal-fired boilers in the United States. And the DOE believes the other boiler types could reduce emissions by blending coal types or using different technologies. In places like Minnesota, adding mercury control technology to local coal plants has only raised had a plan to reduce mercury emissions from their coal facilities? As a nominee to the Board of Directors of TV A, how do you think the TV A could do better in reducing mercury emissions from TVA's coal plants?

   Senator Carper, thank you for bringing this document to my attention. I have not had the opportunity to read and fully understand the technologies it discusses. If confirmed I will discuss with TVA and other experts how environmental systems already in place or planned for implementation on TVA plants are controlling or expected to control mercury emissions. I note the effectiveness reported in the document for sorbent injection technologies. If confirmed I will request TVA to provide me with information on both the effectiveness and costs of installing these technologies on TVA's coal-fired plants. I will additionally request information about the impacts sorbent technology might have upon TVA's commercial disposal of fly ash and its costs.

5. What should the TVA be doing to regulate greenhouse gases? If nominated, how

could you foster partnerships between the Department of Energy and the Environmental Protection Agency to help the TVA deploy new greenhouse gastechnologies?

In its 2008 environmental policy statement TVA cites as its environmental objective for climate change mitigation to "stop the growth in volume of emissions and reduce the rate of carbon emissions by 2020 by supporting a full slate of reliable, affordable, lower-carbon dioxide (CO2) energy-supply opportunities and energy efficiency." It further specifies 7 critical success factors including, among others, reductions in load growth, utilizing lower carbon-emitting energy sources such as renewables, nuclear and combined heat and power, improving the efficiency of the transmission system, and reducing GHG emissions from existing generation. Other environmental objectives for air quality improvement, water resource protection and improvement, waste minimization, sustainable land use and natural resource management also provide critical success factors or strategies that also support the reduction of greenhouse gases. In its current Integrated Resource Planning process TVA commits that the Plan for meeting the electricity needs of the Valley for the next 20 years will meet both the requirements of its Strategic Plan and its Environmental Policy. I am certainly willing to work with representatives of the Department of Energy and the EPA to help TVA identify and explain technologies designed to reduce greenhouse gases.

Senator James M. Inhofe

1. TVA is currently in the process of rebuilding community trust following the Kingston accident. What actions in Roane County would you suggest that TVA take to regain community trust they haven't taken already?

TVA must:

- **Rebuild trust by continuing to listen to the community;**
- **Address these concerns and assure residents of safety;**
- **Repair the damage to the property and return the area as much as possible to its former condition;**
- **Explain to employees at the Kingston Plant and residents of the region why the spill occurred;**
- **Learn from mistakes at Kingston;**
- **Take what is learned and implement it at other plant sites and in the larger organization;**
- **Explain the revised process of handling the fly ash and the additional protections this process provides to the community and its environment.**
- **Explain that this new process is being installed at other coal plants and that the trauma Kingston has suffered will have some positive outcomes by preventing similar accidents at other plants and in other communities;**
- **Continue to test the air and the water and provide accurate information freely to the community;**
- **Provide accurate and continuing information to the teachers and civic groups in Kingston and surrounding communities so that information is broadly and consistently provided;**
- **Restore recreational facilities;**
- **At an appropriate time and after most issues are fully addressed and resolved, memorialize the horror of this largest spill in the nation, how it was repaired and (hopefully) how together TVA and the community rebuilt and recovered.**

2. TVA currently gets almost 50 percent of its power from coal and just over 30 percent from nuclear. What do you think is the optimal mix of coal and nuclear?

   TVA has already committed to produce 50 percent of its power from clean and renewable resources by 2020. I anticipate that nuclear power's share may rise from 30 percent and move closer to 40 percent or more. The continued use of coal at its current level of 50 percent will likely depend upon the development and success of affordable clean coal technologies, particularly if new environmental standards are approved that limit carbon dioxide emissions. Beyond these generalities it is difficult to speculate as to the optimal mix of coal and nuclear without knowing a number of other factors including the costs per kwh for nuclear, clean coal and other fuels and how possible expansions in generation capacity may be financed.

3. Despite the unfortunate accident at Kingston, do you agree that, with the right policies, we can use coal cleanly and efficiently to meet a substantial portion of our electricity demand?

   Coal is very important to the production of electric power in this country. We have it in abundance and at affordable prices. However, in producing electric power, coal also produces pollutants -sulfur dioxide, nitrogen oxide, mercury and carbon dioxide. These emissions are known to produce health issues and environmental damage at certain levels. State and federal policies are either limiting these emissions or moving in that direction. Developing affordable and effective clean coal technologies are likely critical to the Valley's continued reliance upon coal-fired power use at current levels. Recent studies indicate that carbon capture and sequestration is the technology most likely to help reduce the CO2 emissions in the combustion of coal. A 2007 MIT report noted that the "demonstration of technical, economic and institutional features of CCS at commercial scale coal combustion and conversion plants will give policymakers and the public confidence that a practical carbon mitigation control option exists, will reduce the cost of CCS should carbon emission controls be adopted and will maintain the low-cost coal option in an environmentally acceptable manner." I am interested in the efforts of government, higher education and private concerns working to develop these technologies and was pleased to see the President encourage the production of clean coal in his recent State of the Union address. The development of workable and affordable clean coal technologies would significantly affect the future fuel mix in the production of electric power and the reduction of greenhouse gases in the Valley and in the nation.

4. TVA currently has $26 billion in outstanding debt and debt-like obligations. Do you support seeking an increase in the $30 billion statutory debt ceiling or should TVA increase rates to address the imbalance between forecast revenues and obligations?

   If confirmed, I look forward to TVA providing additional information and discussing the cost/revenue issues associated with building new capacity, addressing the costs of the Kingston fly ash spill (including putting the new design for fly ash management in place at other coal plant sites), installing additional pollution technology on TVA's coal fired plants, addressing the shortfall in funding of the TVA retirement plan and projecting expenditures that may be required by anticipated federal legislation or regulatory requirements. With this information and a better understanding of the implications of addressing these issues by rate increases, debt financing or combinations of these two I will be better prepared to answer your question. If confirmed I look forward to discussing these matters and their resolution with TVA's management and financial experts and to working with other members of the Board to address these critical issues.

5. Please provide the Committee with copies of all writings, reports, and advocacy speeches on issues related to TVA.

   Enclosed are very dated articles about rate issues from the 1980s and 2 articles about more recent TVA and utility issues.

Senator Lamar Alexander

1. TVA has a goal to generate 50% of its power from clean sources by 2020. In order to make it from today's level of 40% to the 50% goal, what specific sources of power do you think should be employed?

   I believe that nuclear power is one of the best options if sufficient additional capacity is brought on line by that date. In addition or alternatively TVA might draw on solar power, power produced from biomass or increased purchases of solar or wind power produced in other regions. Conservation and effective load management techniques by customers of TVA power using a smart grid may also contribute to this block of clean power. Currently, TVA is in the process of developing an Integrated Resource Plan that will guide its thinking in addressing the power supply and customer options over the next 20 years. My more complete answer will likely be enhanced by considering that plan.

2. Do you support TVA's nuclear power program?

   Yes, I do support TVA's nuclear power program. The power produced from TVA's six operating reactors is among the Valley's cleanest and most reliable baseload power.

3. Should TVA continue current efforts to build new nuclear power plants at Bellefonte? If so, how many reactors should TVA build at Bellefonte?

   It is my understanding that the Nuclear Regulatory Commission has changed the status of Bellefonte units 1 and 2 from terminated to deferred at TVA's request. Completing these two units is currently TVA's best option for producing clean baseload power necessary to support economic growth in the region. Further, the construction of these two units builds on substantial investments already made by TVA and its ratepayers. Much of my information about the amount and timing of longer term future needs is gleaned from sources in the public press. If confirmed for the Board I hope to have a full discussion of these issues with appropriate TVA management and technical staff involving scenarios/probabilities about economic growth, power use, and other variables included in TVA's Integrated Resource Planning Process. This information is necessary to making longer term commitments about additional nuclear plants.

4. Do you agree that it is a bad idea for TVA to adopt policies that allow putting wind turbines on scenic ridge tops in east Tennessee?

   I do not support the placement of commercial sized wind turbines in scenic or recreational areas. The turbines can be incompatible with the health and preservation of wildlife in some areas. While I support the development of additional renewable energy sources in the Valley I am not convinced that much of the region's topography will support the economic production of wind power.

5. Should TVA place a priority on installing latest available technology for the reduction of sulfur dioxide, nitrogen oxides, and mercury emissions from coal plants?

   It is my understanding that TVA is in the process of installing additional pollution controls on coal fired plants to comply with the ruling in the North Carolina case. These actions and the shutting down of the John Sevier plant should more effectively address concerns about sulfur dioxide and nitrogen dioxide emissions. I do not have data on mercury emissions at TVA's coal plants and how they may be currently limited by the scrubber and other technologies and the type of coal burned at each plant. I know that mercury emissions may impact the fish in our rivers and that the ingestion of these fish by women may produce possible neurological damage to fetuses resulting in impaired cognitive abilities in children. The most recent 10-K for TVA anticipates increased regulation in the future relative to both mercury and the emission of carbon dioxide. Addressing these regulatory requirements may include installing additional controls or considering other fuel mixes in the generation of TVA power. If confirmed I will seek additional information from TVA and experts on this topic as to the possible costs and effectiveness of reducing and controlling mercury emissions with sorbent injection and other technologies and discuss this matter with other members of the Board.

Senator BOXER. Thank you.
Mr. McBride.

STATEMENT OF NEIL G. MCBRIDE, NOMINATED TO BE A MEMBER, BOARD OF DIRECTORS, TENNESSEE VALLEY AUTHORITY

Mr. MCBRIDE. Thank you, Madam Chair, Senator Alexander. I am honored and humbled by the President's nomination and your consideration of my appointment to the Tennessee Valley Authority Board of Directors.

My son Allen is here in the audience. I am very happy to have him with us today.

You have my written statement. I am going to try to point out very briefly how I feel about TVA as an institution and the principles that I would be guided by if I am confirmed as a board member. The recent Ken Burns documentary on our national parks called them America's Best Idea. I have always felt that TVA was also one of America's best ideas. The creation of an agency that would turn America's industrial, engineering and organizational talent to the benefit of one of the poorest regions in our country is still an important and inspiring commitment.

If I am confirmed as a board member, I would try to be guided by four principles. First, the Board's primary obligation is to assure a reliable supply of fairly priced electric power for the people, businesses and industries of the Tennessee Valley.

Second, the Board should continue to support the efforts by CEO Tom Kilgore and his staff to ensure that each one of the TVA divisions, managers and employees understands the importance of all four of TVA's missions: electric power production, environmental stewardship, water management and economic development. Madam Chair, I add that fourth out of the sense of the history of TVA as a water manager in our region. But whether you have three or four missions, managers and employees should not just be driven by the one mission they happen to work with.

Third, the Board should promote accountability and transparency in its own work and out of the agency.

The final principle is one I was reminded of when I recently visited TVA's Bull Run Steam Plant, just a few miles from my home. The plant's visitor's overlook has an historic marker just like the ones you would find in a national park. Across the bottom of the marker in big steel letters are the words "Built for the people of the United States of America." I would challenge the Board and the staff to ensure that both the people of the Valley and the people of American benefit from the programs and the idea of this unique American institution.

I look forward to answering any questions you might have and especially to hearing your views on the complex issues that TVA is facing.

[The prepared statement of Mr. McBride follows:]

Statement of
Neil G. McBride
Nominee to the Tennessee Valley Authority Board of Directors
Before the
U. S. Senate Committee on Environment and Public Works
February 10, 2010

Madam Chair, ranking member Inhofe and members of the Committee, thank you for your consideration of my nomination to the Tennessee Valley Authority Board of Directors. I am honored and humbled to be considered for this position.

TVA and its role in the development of the Tennessee Valley have captured my imagination for many years. You may recall that a recent Ken Burns documentary called our national parks "America's best idea." I have always believed that TVA is also one of our best ideas. The creation of an agency that would turn America's industrial, engineering and organizational talent to the benefit of one of the poorest regions of our country is still an important and inspiring commitment.

On a more personal level, I have had several connections with TVA and the idea it represents. One of my vivid childhood memories was going out to the construction site of the Dalles Dam in Oregon with my father, who was an engineer with the Corps of Engineers District Office in Portland. My brothers and I jumped across the Columbia River, which was about a foot wide. As I grew up, I saw firsthand and gained respect for the kind of engineering and organizational accomplishments that are part of TVA's history. I respect the men and women who make that accomplishment possible.

My wife worked for TVA in Norris, Tennessee. I have known many outstanding TVA employees who are still inspired by its founding ideals. My family enjoyed TVA's lakes and wilderness areas. My son and I have often canoed the white water rivers it maintains. I know many people who work for businesses and industries that came to the Valley because of these natural attractions and because of the affordable and reliable electric power TVA offers.

Finally, for more than 30 years I have lived with, worked among and advocated on behalf of the people who have benefited the most from and been affected the most by TVA – the people of East Tennessee's Appalachian coal fields. They benefit from TVA's success in programs such as power production and flood control. Some of them, as this committee learned from the Roane County residents who came before you last year, are deeply affected when TVA's activities do not succeed.

I hope that this personal and professional experience would bring a useful perspective to the board. If I am confirmed, I would try to be guided by four principles.

First, that the board's primary obligation is to assure a reliable supply of fairly-priced electric power for the people, businesses and industries of the Valley.

Second, that the board should continue to support the efforts by CEO Tom Kilgore and his staff to ensure that each one of TVA's managers and employees understands the importance of all four of TVA's missions – electric power production, environmental stewardship, water management and economic development. Managers and employees should not just promote the one mission they happen to work with.

Third, that the board should promote accountability and transparency, in its own work and that of the agency.

The final principle is one I was reminded of when I recently visited TVA's Bull Run Steam Plant, a few miles from my home. The plant's visitor overlook has an historical marker, just like the ones you'd find in a national park. Across the bottom of the marker, in big steel letters, are the words, "Built for the People of the United States of America." I would challenge the board and the staff to ensure that the people of the Valley and the nation benefit from the programs and idea of this important and unique American institution.

I look forward to answering any questions you might have.

id would, of course, be unfair to the other bidders, since it would allow one bid- er to bid to different terms, conditions, or specifications than other bidders and ould constitute a purchase made without advertising.

In determining whether to award a particular contract to a foreign bidder or allow foreign firms to participate as subcontractors to a domestic supplier, VA follows the guidelines laid down by Congress and the President for the nited States Government as a whole. The principal guidelines in this respect e the Buy American Act and Executive Order 10582, as amended by Executive rder 11051. As you know, the Buy American Act provides that purchases shall made from domestic sources unless the prices quoted by domestic suppliers are nreasonable or the foreign purchases are otherwise inconsistent with the public terest. The act does not specify what constitutes an unreasonable price or when purchase is inconsistent with the public interest, and Executive Orders 10582 d 11051 were issued to provide uniform standards for determining these ques- ons. On the question of price, Executive Order 10582 provides that a domestic d shall be deemed unreasonable and its acceptance deemed inconsistent with e public interest if the amount of the domestic bid exceeds the amount of the reign bid by more than six percent. In accordance with a recommendation of e Council on Foreign Policy, a 12-percent differential is used when the domestic dder is located in an area classified by the Secretary of Labor as one of labor rplus. A 12-percent differential is also used when the low domestic bidder is a all business firm.

In January of 1974, TVA invited bids for the purchase of four turbine gener- ors. The invitation to bid for this equipment contained, as do all of TVA's vitations to bid, terms and conditions specifying the extent the prospective con- actor will be liable to TVA in the event the equipment to be supplied under the vitation is defective or is not delivered in accordance with the contract per- rmance dates. While in most of TVA's invitations to bid a contractor's liability r special or consequential damages is limited to the contract price, this invita- n specifically limits the contractor's liability for such damages to only 15 rcent of the contract price. In addition to other provisions describing the arranty to be furnished with the equipment and certain efficiency guarantees of e equipment, the invitation to bid also contained an *Operating Assurance* use which specifies the extent of the contractor's liability in the event the uipment fails to operate properly during the first 12 months of operation, and *Liquidated Damages* clause which establishes the amount TVA will be damaged the equipment is late in being delivered. The contractor's maximum liability der these two provisions is 25 percent of the contract price. Bids were received der this invitation to bid from Brown-Boveri Corporation, Allis-Chalmers wer Systems, Inc., General Electric Company, and Westinghouse Electric Cor- ration. Allis-Chalmers, General Electric, and Westinghouse each conditioned eir bid on deletion of the *Operating Assurance* and *Liquidated Damages* clauses d on a complete waiver of special or consequential damages. In addition, Allis- almers took other exceptions to the provisions contained in the invitation, in- uding the warranty and efficiency guarantee. General Electric Company also ted that its "Conditions of Sale" (which differ materially from the terms d conditions of the invitation) would prevail and that any provision contained the invitation and not in General Electric's "Conditions of Sale" was un- ceptable. Westinghouse also excepted to the warranty contained in the invita- n. Since the bids of Allis-Chalmers, General Electric, and Westinghouse con- ined material exceptions to the terms and conditions of the invitation, their ds could not be considered for award of a contract. Brown-Boveri Corporation's d was the only bid fully responsive to the invitation, and in March 1974 TVA arded a contract to that company at a firm price of $184,435,400.

It has been TVA's experience in recent years that exceptions to the liability ovisions of invitations to bid for turbine generators have increased. If TVA ere to contract on this basis, all or substantially all of the risk would be shifted TVA, and any expenses or costs occasioned by late delivery of the equipment failure of the equipment to operate properly would be for TVA, the purchaser, ther than the manufacturer. However, TVA has reviewed this situation and on veral occasions has modified its terms and conditions to further reduce a con- actor's potential liability while maintaining some degree of protection for TVA. e feel that the terms and conditions contained in the invitation to bid for these rbogenerators represented an equitable allocation of the risks.

The contract awarded Brown-Boveri contained an option to purchase two addi- onal machines at a firm price of $107,654,810 for delivery in 1978–81. A com-

parison of this price, in January 1975, with published handbook prices of domestic turbine generator manufacturers showed that significant savings would inure to TVA from the exercise of its option with Brown-Boveri. In addition, TVA will realize other benefits and cost savings because of the economies in purchasing two additional machines which duplicate those purchased last year. Accordingly, the decision was made to exercise the option.

While we do not know the exact value of the subcontracts to be placed with U.S. firms, Brown-Boveri has informed us that a substantial portion of the work necessary to fulfill the turbogenerator contracts will be done by its plant in Richmond, Virginia, and by Foster Wheeler Corporations at its plants in New Jersey and Texas. In addition, the Brown-Boveri price includes import duties on the six turbine generators of about $14 million to be paid by the contractor to the United States Treasury.

If we can provide you with any further information, please let us know.

Sincerely yours,

AUBREY J. WAGNER,
Chairman of the Board.

The CHAIRMAN. The next witness is Mr. Neil G. McBride on behalf of the East Tennessee Energy Group and Save Our Cumberland Mountains.

TESTIMONY OF NEIL G. McBRIDE, ON BEHALF OF EAST TENNESSEE ENERGY GROUP AND SAVE OUR CUMBERLAND MOUNTAINS

Mr. MCBRIDE. Mr. Chairman, members of the committee, I am Neil G. McBride. I am an attorney from Jacksboro, Tenn. I am here on behalf of two organizations, Save Our Cumberland Mountains and the East Tennessee Energy Group. The energy group is a coalition of students and citizens in Knoxville, Tenn., who are interested in all aspects of energy policy in the Tennessee Valley. Save Our Cumberland Mountains is a 400-member, 5-county organization of citizens in east Tennessee who are concerned primarily with environmental problems in their area. It is a grassroots organization led by farmers, retired coal miners and working people in Tennessee's Appalachian coalfields.

We appreciate this opportunity to testify on this important bill. When I discussed the possibility of presenting this testimony with the committee's staff I was asked whether we were for or against the bill. I told them that we were neither for it nor against it. I guess that since I was representing environmental organizations they figured we had to be against it, so that is why we are here in the lineup. I hope that my testimony will show that we are mainly asking that the legislation be qualified so as to insure the most effective use of the capital resources TVA plans to raise. I hope my testimony will show that we are mainly asking that legislation be qualified in effective use of the capital resources TVA plans to raise.

I would like to begin by emphasizing what I do not plan to say: We are not here today to oppose nuclear powerplant construction and we are not prepared to argue that TVA needs no new power-generating capacity or that it should not be given any increase in its bonding authority.

Instead, we offer two very specific questions which we hope the committee will ask itself in considering this legislation. First: Can TVA save itself and its consumers some money by devoting a larger share of its resources to the encouragement of more efficient use of available power? Second: Does the committee want to give up its power to review TVA's activities for the full amount of time it will take the agency to use up an additional $10-billion limit?

I will briefly discuss this final question first because it poses a political rather than a technical problem, a problem which you as Congressmen are uniquely suited to resolve.

As you know, TVA was established not only as a source of power and development for the valley, but as an experiment in grassroots democracy, a new form of government: The regional authority. In recent years, however, local and national leaders, including citizens, county judges, Governors and Congressmen, have become increasingly critical of TVA's lack of accountability to the public. You can speak to any of your Members from the area and you will find their mail reflects this to a large degree.

When it comes right down to formal power to shape TVA's policies, the agency is accountable only to the President and Congress. The President, with the Senate's approval, appoints members of the three-man board as their 9-year terms expire. The Congress considers TVA's annual appropriations and occasional requests for legislative amendment, as you are doing today.

Although recent events have shown that the selection of board members can be a vital process, congressional oversight of TVA activities has not been as close as it could have been. TVA's congressional appropriation represents only a fraction of its total budget and TVA's regional character seems to weaken the interest of Congress as a whole in overseeing its activities. As citizens' groups which are interested in improving TVA's accountability to the public, we urge you not to give up any of the small measure of control that presently exists.

Congressional guidance is more important than ever. TVA is capable of providing enormous leadership to the Nation's utility industry, leadership which is critical as the energy crisis worsens. This leadership does not just involve more power production, but more efficient and imaginative approaches to common industry problems. It does not imply a criticism of the agency to argue strongly that Congress should become as involved as it possibly can in insuring that TVA provides such leadership.

In considering such a massive increase in the agency's bonding authority, you are in the position of a corporate director being asked to sign 10 or 15 years of blank checks. It is just not good business.

As Mr. Watson's chart indicates, $5.6 billion is the total obligations in the preliminary stage not approved by the government bodies needed. $2.2 billion of that total obligation have had no previous expenditure at all. In other words, this is an increase which could be deferred pending your later consideration of the request.

TVA's bonds are not, of course, direct appropriations. But they represent 3 percent of the national debt. They have an enormous influence on private bond markets and would affect the availability of capital for other energy-related purposes. Congress should maintain its supervision of TVA's bonding authority so it can make sure that capital resources are put to the most efficient possible use. The power to review TVA's bonding authority is an opportunity which should not be surrendered without a very good reason. In the absence of such a compelling reason, you should consider raising TVA's debt

ceiling only by the amount it needs to carry on its program for the immediate future.

A later amendment need not represent a major commitment of TVA or congressional resources. The proposed bill fits nicely on one printed page. As TVA needs additional authority, it can ask for it, and welcome the opportunity to inform Congress of its problems and progress in meeting the energy needs of the region.

As TVA does come back for additional authority, one of the questions you will want to ask will be, is this new construction required to meet peak or daily loads? If it is for peakloads, very careful study will have to be made of whether the peak could be reduced by proper load management.

TVA may question the need for peak reduction measures to its own system because of its interchange agreements with other systems during off-peak periods. If significant peaks can in fact be reduced, then to make this argument would be to justify new capacity by the needs of other utility systems. TVA's consumers would, in effect, be subsidizing neighboring private utilities. As a national resource TVA should be supplying power throughout the country when it can, but Congress should be specifically informed if TVA justifies its new capacity requirements by the needs of other systems.

The first question I posed for the committee, whether TVA has exhausted all possible means of saving itself and its consumers the cost of the new construction anticipated by this bond limit increase, its really just a specific example of why TVA should remain accountable to Congress. During last fall's coal shortage the subject of energy conservation was of tremendous public interest for the people of the Tennessee Valley. It was during that period, when the coal miners' strike brought TVA's stockpiles to an emergency level, that TVA began its first intensive conservation campaign.

At the peak of the crisis it put out a press release which, among other things, urged the people of the valley to "Avoid staying up late which requires use of lighting and appliances—form the habit of longer hours of rest at night." It was a suggestion which I comply with as often as possible, but I doubt that it allowed those who were concerned about the effectiveness of TVA's conservation program to sleep soundly. TVA put out other press releases, of course, and it has other programs to encourage conservation, but it is not unfair to suggest that the statement represents a low level of commitment to the problem.

Before the committee grants TVA this huge increase in bonding authority we urge you to insist on a thorough study of the effectiveness of TVA's conservation efforts and possible alternatives to new plant construction.

A few weeks ago TVA issued a draft environmental impact statement entitled Policies Relating to Electric Power Rates. The statement discussed TVA's conservation efforts and the potential energy savings of load management and new approaches to pricing. Its conclusion, that very little reduction in power use was possible through economically feasible conservation efforts without significant decline in standard of living or production, was not in line with several Federal and private studies of the same subject. While TVA dismissed load management as an effective tool for conservation, for example, the Federal Energy Administration is intervening in several State regulatory proceedings in favor of improved load management.

TVA's system is unique and may not be subject to the same criticisms of many private utilities, but conflicts between TVA's conclusions and other Federal policies suggest at the very least that further study is essential before Congress allows the full program of new construction anticipated by this legislation.

Some of the conclusions which should be examined are independent of the characteristics of TVA's system. For example, TVA dismisses potential energy savings in the industrial sector by noting that 95 percent of industrial power use is directly related to production, implying that any energy saving would come only at the expense of reduced production [environmental impact statement, at p. 3.0-5]. This assessment is at odds with numerous studies which show that use of energy per unit of production is higher in the United States than in other industrialized nations of the world. The impact statement rejected studies by the Oak Ridge National Laboratories which suggested significant potential savings in the industrial sector.

TVA stated: "Since ORNL found no significant relationship between electricity and industrial output, the ORNL results for the industrial sector are questionable." [At p. 3.0-16.]

The implication is that TVA has rejected another Federal study because it does not agree with its own conclusions. The ORNL studies mentioned are in a preliminary phase and are not available for full comparison.

Of special interest to the TVA region should be the Ford Foundation's energy policy project conclusion: "It is reasonable to expect that energy conservation in the most energy intensive manufacturing"—of which we have many—"industries will have little, if any, adverse effect on employment in these industries." "A Time To Choose," final report by the energy policy project of the Ford Foundation, 1974, at page 151.

Discussing potential savings in the residential sector, which TVA also dismissed as insignificant in its impact statement, the Joint Report of the Congress on ERDA appropriations concluded:

> It is quite reasonable to anticipate that this program should lead to a reduction of from 20 to 50 percent of the energy used in existing buildings by the development and economical application of technology. At least a 50-percent reduction should be achievable in new buildings, with at least an overall sector average reduction of 30 percent. (Joint report, authorizing appropriations for ERDA for fiscal year 1976, No. 94-294, June 13, 1975, at p. 133.)

In applying national estimates to the TVA region it is reasonable to assume that potential savings should be even greater because of the extremely low cost of power and TVA's aggressive promotion of the use of electricity. These factors have caused the average residential consumer in the Tennessee Valley to use twice the amount of power as consumers in the rest of the country. Not all of this power could be conserved without the use of some substitute fuels, but the studies cited above suggest significant savings that TVA does not officially acknowledge.

The purpose of this testimony is not to suggest that any one study or prediction is correct. I do suggest that TVA's studies of the problem,

as described in its environmental impact statement and its public statements, are not worthy of its stature as the Nation's largest electric utility and a national yardstick for the utility industry.

At this point I should note that in the testimony of Mr. Wagner and Mr. Watson, there was no discussion of conservation measures, which I think would be an appropriate addition in their argument.

The Chairman. Mr. McBride, you will have to utilize some conservation. We have a roll call. So if you will proceed with your text.

Mr. McBride. Thank you, Mr. Chairman. I am just about finished.

Criticism of TVA's efforts are not a contradiction of the remarks made concerning TVA's successes in other areas. It is because of these successes that we now ask that skills be applied to a new endeavor, not just more energy, but more efficient use. This effort as recognized by ERDA and Congress as a necessary element of national energy policy; one which creates new energy as much as new generating power does. We are asking that in considering this legislation you make sure TVA is in line with that policy.

The Chairman. Thank you very much, Mr. McBride. Your organization should be proud of your presentation and the very great efforts you have made in accumulating the facts which support the conclusions you have made.

Any questions?

Mr. Edgar. I have a question.

I think I understand your testimony and I appreciate your comments.

Looking at the bill, H.R. 9472, are you suggesting the amount could be reduced? And are you asking that the TVA come back after that first step, at which time Congress will have a better handle on the TVA's progress?

Mr. McBride. I think the chart at the back of Mr. Watson's testimony shows that.

Mr. Edgar. I appreciate your testimony; and we thank you.

Ms. Abzug. Are you suggesting that this committee exercise more significant oversight over the full efficiency of any funding granted?

I would like to ask the chairman if it is not, indeed, our concern and practice to continue some kind of oversight over the uses of the capital resources we have authorized here.

The Chairman. Yes; the oversight subcommittee will have that authority to look at the operations of TVA. Also, TVA makes the justification each year to the Appropriations Committee of its expenditures, not only the annual appropriations but the expectancy of the funds received from the sale of bonds and makes a total account of the use of the bond moneys to the Appropriations Committee. The projected power construction program for each year is transmitted to the Congress by the President, with his recommendations, in the budget estimates. So we have several avenues of total approach and examples of the use of every penny coming into the TVA. That has been exercised over the years.

The committee will stand in recess for 20 minutes in order to respond to the quorum call of the House.

[Brief recess.]

The Chairman. The committee will be in order.

TVA
Decisionmakers

TABLE OF CONTENTS

Introduction i

Part I: A Study of the Board of Directors of the Tennessee Valley Authority 1

Part II: TVA's General Managers 11

Part III: Managers and Directors of TVA Offices and Divisions 14

Prepared by the East Tennessee Research Corporation

**East Tennessee
Research
Corporation**

JACKSBORO, TENNESSEE 37757
(615) 562-3396

The East Tennessee Research Corporation (ETRC) is a non-profit organization established in 1973 to provide legal and technical assistance to community groups in the Appalachian coal fields of East Tennessee.

One of ETRC's major purposes is to study the decision-making processes of the Tennessee Valley Authority and attempt to open those processes to more public participation. As a part of that overall study, the ETRC staff has compiled a brief description of TVA's top decision-makers. This study is in three parts:

Part I: The Board of Directors of the Tennessee Valley Authority. (Completed and released August 9, 1976, revised December 1976.)

Part II: TVA's General Managers.

Part III: Managers and Directors of TVA Offices and Divisions.

The TVA Act gives the Board a wide range of authority to implement policy regarding the powers specifically conferred on the agency. For this reason, individual board members and administrative officials have tremendous discretion in deciding how to carry out the original congressional intent of the Act. The law did not dictate a rate structure for electricity consumers, nor did it outline precise methods of economic development. The Act's broad mandate makes the quality of leadership essential to the ability of TVA to function properly.

The Board was given the power to "appoint such managers, assistant managers, officers, employees, attorneys, and agents, as are necessary for the transaction of its business. . ." Nowhere in the Act is there specific mention of the duties and responsibilities of a General Manager. But historically the General Manager has had a major, and sometimes dominant, influence on TVA policy.

Among federal agencies, TVA has a reputation of giving its administrative staff broad authority to carry out agency policy. A former TVA personnel director wrote:

> The tacit assumption in the TVA Act was that a public official normally prefers to do an honest job, and that the way to obtain competence in the public service is to select men of integrity for the highest positions and then vest in them complete responsibility for achieving results. ("Personnel Administration," by Harry L. Case, in TVA, The First Twenty Years, Roscoe C. Martin, Ed., p. 53-54)

Under such a policy, an understanding of the background and experience of TVA's top administrative personnel is essential to the public's understanding of TVA policy and programs. This study does not make judgments about the competency of the personnel described.

Information for biographical sketches in this report was provided by the TVA Public Information Office or gathered from news articles from various newspapers. The TVA Public Information office has reviewed Part III, the description of TVA's present managers and division heads.

In releasing this study ETRC hopes to provide the public, including news reporters, scholars, businessmen and citizen groups, a document to improve their understanding of who is making the decisions so vital to their interests, a study that can be used repeatedly for background material or as a reference. ETRC gratefully acknowledges the generous cooperation of TVA's Public Information staff.

William A. Allen
Neil G. McBride

Staff Attorneys

December 1976

PART I

A STUDY OF THE BOARD OF DIRECTORS OF THE TENNESSEE VALLEY AUTHORITY

> The full success of the Tennessee Valley Authority development project will depend more upon the ability, vision and executive capacity of the members of the board than upon legislative provisions.
>
> --From the Legislative
> History of the Tennessee
> Valley Authority Act

The Board of Directors of the Tennessee Valley Authority is comprised of three persons selected by the President with the approval of the Senate to serve staggered, nine-year terms. The President also designates the chairman of the Board.

Fifteen persons have served on the TVA Board since 1933. Six directors were college presidents, deans or professors; five were engineers, four were lawyers and one an accountant. Four members could be considered politicians: two were appointed shortly after being defeated for reelection -- one to the Senate, one to the House. Four directors came from positions in state or national government; one director was a journalist. Two directors served as TVA General Manager prior to appointment to the Board. All have been white males.

One director, Arthur E. Morgan, was removed while in office. Raymond Ross Paty died during his term. Four members have resigned before completing their terms. Six persons have been reappointed to a second term, but only two directors were appointed by more than one President: Aubrey Wagner (Kennedy, Nixon) and Frank Smith (Kennedy, Johnson). Jimmy Carter as President will have an opportunity to appoint at least two directors, one to a vacancy existing now and one when Wagner's term expires in 1978.

The last two Presidential nominees for the Board were not approved by the Senate. In the 43-year history of the agency, only one other nominee was not confirmed.

In 1951 when President Truman nominated Frank A. Waring of California, several area Senators and Congressmen were upset because they were not consulted. Senator K. D. McKellar (D-Tenn) led the fight and six weeks later Truman appointed Waring to a State Department position in Tokyo, Japan. Waring, an economist and former head of the Philippine War Damage Commission, said he requested the change in assignments.

James F. Hooper of Mississippi was nominated by President Ford in June 1975. Senator Bill Brock (R-Tenn) led opposition to his nomination. The Senate Public Works Committee held hearings on Hooper's nomination and voted in February 1976 to postpone indefinitely any action. The President then withdrew the nomination. Hooper was challenged for his lack of experience and involvement in several unsuccessful business ventures. Several members of the Senate committee stated they did not feel he was qualified for the position as TVA director.

In June 1976, Thomas L. Longshore, an Alabama Power Company executive, was nominated by President Ford. After hearings on the nomination the Senate Public Works Committee rejected him by an 8-6 vote in August 1976. The American Public Power Association and other public power advocates opposed Longshore because of his relationship to private power companies. Several consumer and environmental groups challenged his qualifications and knowledge of TVA issues. Since the Committee vote was along party lines, Longshore is seen by some as a casualty of election-year politics.

The average age of appointees is 52.4. Average age upon retirement, resignation or replacement is 62.14. Length of service ranges from 16 months by Frank Welch to 15 years by Aubrey Wagner. The average is 8.79 years.

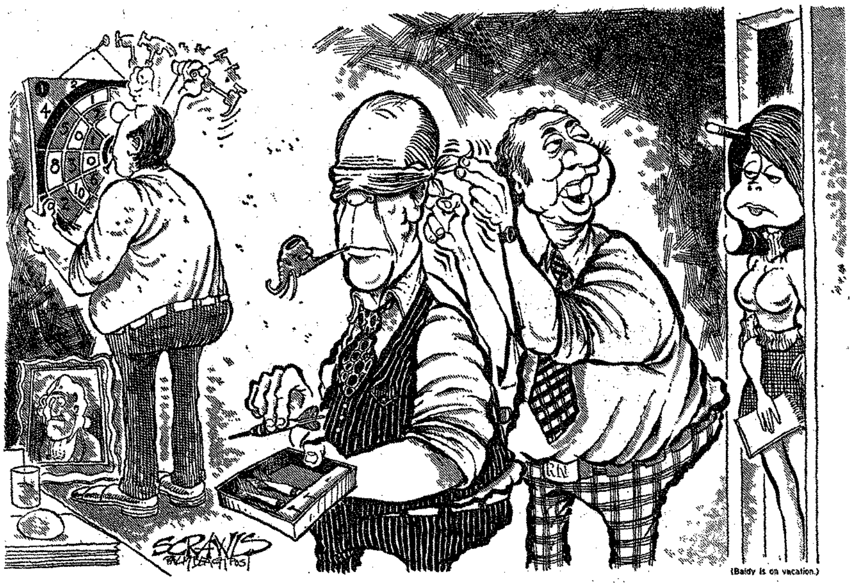
The TVA Act is relatively silent about qualifications for Board members. It requires each director to be a United States citizen, to take an oath to support the Constitution and faithfully and impartially perform the duties set by the Act, and to profess a belief in the feasibility and wisdom of the Act. No director shall have financial interest in any public-utility corporation engaged in distributing and selling power to the public nor in any corporation manufacturing, selling, or distributing fixed nitrogen or fertilizer. No member shall have any interest in any business that may be adversely affected by the success of the Corporation as a producer of electric power or of concentrated fertilizers. No member of the Board shall engage in any other business while in office. [16 U.S.C. 831(a) and (g)]

The TVA Act contains no requirement that Board members be from the Tennessee Valley region, and, in fact, only three directors have been from the seven states making up the TVA service area.

Although the Act sets few standards of qualification for Board members, the Legislative History lists several traits Congress felt were important. The Conference Report accompanying H.R. 5081 of the 73rd Congress, 1st Session, May 15, 1933 states:

The board of three members should not only be sound and experienced men of affairs; they should not only be soundly educated and widely traveled and well-read men; but they should be men of constructive vision, to seek to fit the future into the form of the present. Therefore, the board is charged with the duty of constantly studying the whole situation presented by the Tennessee River Valley, and the adjoining territory, with the view of encouraging and guiding in the orderly and balanced development of the diverse and rich resources of that section. It is a great responsibility imposed upon the members of the board. But it is a great opportunity that will come to those chosen for this great service. For such position of trust and responsibility undoubtedly the President will search the Nation over for the right men to whom to entrust not only this vast investment of money but this great responsibility, not only to the people of that section of the country but to the people of the whole Nation. If, through the incapacity or the indifference of the members of the board, this great humanitarian project should fail, then progress along this line in other parts of the country will be set back for two or three generations.

With such a responsibility upon the President in choosing the right men, and with such a responsibility resting upon the consciences of the men thus chosen, we cannot believe that there will be failure. When the race advances it must do so along the road of faith in ourselves and our fellows. The members of the board are given the term of 9 years, so there may be consistency and continuity in the policies of the authority.



'Please don't interrupt, Miss Helmsly. The President is preparing to make a political appointment.'

(Courtesy of Scrawls and the Palm Beach Post, Palm Beach, Florida)

TVA BOARD OF DIRECTORS

ARTHUR E. MORGAN--1933-1938 (Roosevelt). Born: 1878, Cincinnati, Ohio. Died: 1975. Served as chairman of the first Board of Directors from 1933 until removed from office in 1938 by President Franklin D. Roosevelt because of his inability to work with the other two board members. He was president of Antioch College, Ohio, when appointed to the board although he had only a high school education. He was a civil engineer by trade and was president of Dayton-Morgan Engineering Co. until 1933. He served as advisor to several southern states on reclamation practices, helped draft and revise water and drainage codes for several states, and was a nationally recognized authority on water resource development. Books: The Making of TVA, (1974); Search for Purpose, (1955); The Miami Conservancy District, (1951); The Small Community, Foundation of Democratic Life, (1942); The Long Road, (1936); My World, (1927); Miami Valley and the 1913 Flood, (1917); Morgan vs. Lilienthal: The feud within the TVA, Thomas K. McCraw, (1970); The Human Engineer: A. E. Morgan and the Launching of TVA, Ray Talbert, (1967).

HARCOURT A. MORGAN--1933-1948 (Roosevelt). Born: 1867, Ontario, Canada. Died: 1950. He was appointed to the first board in 1933 and reappointed in 1939. He served as chairman of the board from 1938-1941 after A. E. Morgan was ousted. Harcourt Morgan sided with David Lilienthal in disputes with the chairman. Morgan was president of the University of Tennessee at the time he was appointed. Prior to that he was a professor of zoology and entomology and was director of the UT Agricultural Experiment Station. His chief interests were agriculture, land and forestry programs. He retired at age 81. Books: Threshold of a New Day: The University of Tennessee, 1919-1946, James Riley Montgomery; The Volunteer State Forges Its University: The University of Tennessee, 1887-1919, Montgomery.

DAVID E. LILIENTHAL--1933-1946 (Roosevelt). Born: 1899, Morton, Ill. He was a member of the original board and was reappointed twice by President Roosevelt. He served as chairman from 1941 to 1946. Lilienthal resigned from the TVA board in 1946 to become chairman of the Atomic Energy Commission, a post he held until 1950. He set up the Development and Resources Corporation in New York City as a private enterprise system of putting the TVA idea to work in underdeveloped regions of Asia, Latin America, and Africa. He was later joined in the corporation by TVA officials Gordon Clapp and John Oliver. Lilienthal was a Harvard Law School graduate and practiced law in Chicago, specializing in utility law. He was a state public utilities commissioner in Wisconsin for two years prior to his TVA appointment. During that time he completely rewrote that state's utility code, which became a model for the Nation. Books: The Journals of David E. Lilienthal; The TVA Years, The Atomic Energy Years, The Venturesome Years

The Road to Change, The Harvest Years, (1964); Change, Hope and the Bomb, (1963); Big Business: A New Era, (1953); TVA: Democracy on the March, (1944, 1953); This I Do Believe, (1949). Morgan vs. Lilienthal: The Feud Within TVA, Thomas McCraw, (1968, 1970); David Lilienthal: Public Servant in a Power Age, Willson Whitman, (1948).

JAMES P. POPE--1939-1951 (Roosevelt). Born: 1884, Jonesboro, La. Died: 1966. He was appointed to fill the unexpired term of Arthur Morgan in 1939 shortly after being defeated for reelection to the Senate from Idaho. He was reappointed in 1942 to a full term. After retiring in 1951, he practiced law in Knoxville and served as president of the Knoxville Roundtable of the National Conference of Christians and Jews. He left Knoxville in 1963 to retire in Alexandria, Va. He was graduated from the University of Chicago Law School and served in various political positions in Idaho, including mayor of Boise, before being elected to the Senate in 1933. He was active in Democratic Party politics in Idaho. In 1952 while a candidate for delegate to a state constitutional convention, the Knoxville Journal labeled him in a news article as "a left-winger with socialistic philosophy and a red-hot internationalist and friend of Russia. . . . . time has not faded Pope's pink beliefs."

GORDON R. CLAPP--1946-1954 (Truman). Born: 1905, Ellsworth, Wis. Died: 1963. Was appointed chairman of the TVA Board in 1946 to replace Lilienthal who resigned. Clapp was not reappointed by President Dwight D. Eisenhower, who labeled TVA as "creeping socialism" during the presidential campaign. It was widely reported that the private power forces were determined to "get" Gordon Clapp after the election. Eisenhower's Secretary of Commerce, Sinclair Weaks, a Boston capitalist with connections to major banks **investing** in private utilities, was reported to be the major influence on Eisenhower. When Clapp was nominated as chairman in 1946, he was opposed by both Tennessee senators, McKellar and Stewart, and by Kentucky Senator John Sherman Cooper. Clapp joined TVA in 1933 as assistant personnel director and served as general manager from 1939 to the time of his board appointment. He was an assistant dean at Lawrence College, Appleton, Wisconsin, before joining TVA. After his term on the board expired, he became deputy city administrator of New York City and later joined Lilienthal in the Development and Resources Corporation of New York City, of which he was president until his death in 1963. Notable quotes: "TVA's idea of abundant use of electricity so stimulated the nation's demand for power that the private utilities have been forced away from their old theory of scarce power at high rates." "Atomic power, in our lifetime, will not compete with the electrical energy in areas of low cost power such as the Tennessee Valley and the Northwest." (1954). Books: The TVA: An Approach to the Development of a Region, (1955, 1971).

HARRY A CURTIS--1948-57 (Truman). Born: 1884, Sedalia, Colo. Died: 1963. Was another Truman appointee not reappointed by Eisenhower. He joined TVA in 1933 as chief chemical engineer and served in that capacity until 1938 when he was named dean of the college of engineering at the University of Missouri. Curtis was a nationally acclaimed authority on chemical engineering. Prior to joining TVA, he was a professor at Yale, Northwestern, and Colorado Universities and was associated with Vacuum Oil Co., International Coal Producing Corp., and Clinchfield Carbo Coal Corp. President Calvin Coolidge appointed him to study the Muscle Shoals plant facilities. Books: Fixed Nitrogen, (1932).

RAYMOND ROSS PATY--1952-1957 (Truman). Born: 1896, Bell Buckle, Tenn. Died: 1957. Was appointed to the board in 1952 and served until his death. At the time of Harry Curtis' retirement, he called on Eisenhower to appoint a non-partisan member of the board and said the last two years under Chairman Vogel (an Eisenhower appointee) had not been very pleasant. Paty was president of Birmingham Southern College, the University of Alabama, and chancellor of the University of Georgia. After graduating from Emory University, he established the Cumberland Mountain School in Crossville, Tenn. and served as principal. At the time of his appointment, Paty was executive director of the Rich Foundation of Rich's Inc. Department Stores in Atlanta.

HERBERT D. VOGEL--1954-1962 (Eisenhower). Born: 1900, Chelsea, Mich. Was named chairman of the board after the controversial non-renomination of Gordon Clapp. Because Eisenhower had stated he wanted to find a man with his philosophy of the agency, it was widely believed that Vogel was being sent to help destory TVA. Even with the controversy over his appointment, he was confirmed by the Senate with only one dissenting vote (Wayne Morse, Ore.) After coming to the board, however, Mr. Vogel was generally recognized as an effective member who supported the TVA concept. Vogel was a strong supporter of the Dixon-Yates contract (Paty and Curtis outvoted him). He was instrumental in getting Congress to pass self-financing legislation for TVA in 1959. Vogel fired TVA's general counsel Joseph Swidler (later FPC chairman) after he found out Swidler was compiling information against a possible TVA board nominee. Vogel attended the University of Michigan for two years and was graduated from West Point Military Academy in 1924. He served in the Army Corp. of Engineers until 1954 and achieved the rank of brigadier general. He served as lieutenant governor of the Panama Canal Zone from 1950-52. He was founder and director of the U. S. Waterway Experiment Station at Vicksburg, Miss., from 1930-34. Vogel resigned from the Board in 1962 and became an engineering consultant in Knoxville and was mentioned as a Republican candidate for governor. In 1963 he became an engineering advisor to the World Bank (whose president had been associated with the Dixon-Yates contract).

ARNOLD R. JONES--1957-1966 (Eisenhower). Born: 1904, Haddam, Kan. Died: 1975. Apointed director in 1957 by President Eisenhower and met with strong opposition from a Democrat-controlled Senate. The subcommittee held hearings on the nomination but refused to act during the session. Jones was given an interim appointment and was finally confirmed a year later at the same time as Frank Welch. Liberal newspapers throughout the country protested his nomination and investigated his background. He was accused of being hostile to rural electric cooperatives while on the Kansas Corporation Commission (which regulates utilities and railroads). Jones was an accountant and served as assistant budget director and state accountant of Kansas. After military service, he became dean of financial administration at Kansas State College. He was recruited to reorganize the state's financial structure and then became director of the department of administration in the governor's office. He was named deputy director of the budget (an agency considered an enemy to TVA during Eisenhower's administration) in 1956. When it became apparent President Lyndon Johnson was not going to reappoint Jones to another term, he took a job as professor of business at the University of South Florida. In announcing his retirement, Jones said: "I have learned that the most important element in any undertaking is PEOPLE. In a consumer-oriented enterprise like the TVA power system, we must never forget that service to the people--the citizens of the Valley and the nation--is our constant responsibility." Magazine articles: The Financing of TVA, Law and Contemporary Problems, pp. 725 - 740. Duke University Law School, Autumn, 1961.

FRANK J. WELCH--1957-1959 (Eisenhower). Born: 1902, Winfield, Texas. Was appointed to the Board by President Eisenhower in 1957, but resigned about a year later to return to the University of Kentucky as dean of the agriculture school. He was appointed to fill the unexpired term of Raymond Paty after being given a leave of absence from UK. In an apparent attempt to get Eisenhower to assure his reappointment, Welch submitted his resignation. Somewhat surprisingly, the President accepted the resignation. Welch would have lost his retirement rights at the university if he had not gone back when he did. He also served as dean of the Mississippi State Agriculture College. He served on the War Labor Board and as economic advisor to the National Cotton Council. Welch was a Democrat and was appointed because Eisenhower thought the law required at least one Democrat and one Republican on the Board. It was also speculated that Welch was nominated to facilitate the confirmation of A. R. Jones, whose nomination was in trouble in the Senate.

BROOKS HAYS--1959-1961 (Eisenhower). Born: 1898, Russellville, Ark. was appointed in 1959 by President Eisenhower to fill the unexpired term of Frank Welch. He was reappointed in 1960 but served only a year of that term before resigning to take a position as Assistant Secretary of State for Congressional Relations. Before his TVA appointment, Hays served eight terms as U. S. Representative from Arkansas. He was defeated for reelection in

1958 (by a rabid segregationist) for his moderate stand on racial integration. He was a lawyer and served as assistant attorney general in Arkansas. He was president of the Southern Baptist Convention in 1957-58. Books: A Hotbed of Tranquility; My Life in Five Worlds, (1968); A Southern Moderate Speaks, (1959); This World: A Christian's Workshop, (1958).

FRANK E. SMITH--1962-1972 (Kennedy, Johnson). Born: 1918, Sidon, Miss. Was appointed to the Board by President Kennedy to replace Herbert Vogel. He was strongly opposed by Sen. Bill Brock and not reappointed by President Nixon. During his term he was highly critical of national fuel oil monopoly interests and was a strong supporter of the Tennessee-Tombigbee Waterway Project. Smith, a former newspaper reporter and editor, served six terms as U. S. Representative from Mississippi before being defeated in a Democratic primary in 1962. He was co-author of the TVA self-financing legislation. Smith worked as a legislative aid to Sen. John Stennis (Miss.) and was a Mississippi state senator. After his term on the TVA Board expired, he ran for Congress from Mississippi but was defeated in a nine-candidate primary. Books: Land Between The Lakes; Experiment in Recreation, (1971); Land and Water, (1971); The Politics of Conservation, (1966, 1971); Mississippians All, (1968); Look Away From Dixie, (1965); Congressman from Mississippi, (1964); The Yazoo River, (1954).

DON MCBRIDE--1966-1975 (Johnson). Born: 1903, Cowles, Nebraska. He was involved primarily in the field of water resource development through more than 30 years of service with Federal and state organizations. He was a major force behind the Tennessee-Tombigbee Waterway Project. After graduating from the University of Nebraska, he was an engineer with the State of Oklahoma and is credited with building 23 dams enabling Tulsa, Okla. to become a seaport. He also helped design the Arkansas River basin dam system. He served on the Oklahoma Planning and Resources Board and was secretary-manager of the National Reclamation Association. McBride was a special assistant on the staff of Sen. A. S. (Mike) Monroney at the time of his appointment to the TVA Board. Earlier he had served on the staff of Sen. Robert S. Kerr. Books: TVA and the National Defense, (1975) AUBREY J. WAGNER--1961- (Kennedy, Nixon). Born: 1912, Hillsboro, Wisconsin. Appointed by President Kennedy to fill the unexpired term of Brooks Hays and was reappointed to a full term by President Nixon in 1969. He has served as chairman since 1962. He joined TVA in 1934 as an engineering aide in the General Engineering and Geology Division. Wagner was named chief of the Navigation and Transportation Branch in 1948 and Assistant General Manager in 1951. He was appointed General Manager in 1954 and held that post until appointment to the Board. As General Manager he was a strong influence on Chairman Vogel during a period in which it was felt the Eisenhower Administration intended to destroy the agency. Before joining TVA, Wagner was an instructor at the University of Wisconsin. He received a bachelor's degree in civil engineering from Wisconsin. He was a member of the President's Appalachian Regional Commission, 1963-65. Wagner is active in the Boy Scouts of America.

WILLIAM L. JENKINS -- 1972- (Nixon). Born: 1936, Detroit, Michigan. Appointed in 1972 at the urging of Senator Bill Brock. Prior to his appointment, he served as Tennessee Conservation Commissioner. He was defeated in a bid for the Republican nomination for Governor in 1970. Jenkins served four terms as a state representative and was speaker of the house. He practice law in Rogersville, Tennessee after graduation from the University of Tennessee Law School. He received a bachelor's degree in 1958 from Tennessee Tech, Cookeville, Tennessee. He owns a 200-acre farm near Rogersville.

The original TVA Board of Directors in session in 1935. From left: Dr. H. A. Morgan, D. E. Lilienthal and chairman A. E. Morgan. (TVA photo)

TVA BOARD OF DIRECTORS—HISTORY

All Board members are appointed by the President, subject to Senate confirmation. Appointments run for nine years (except the original unequal periods set up to stagger the terms), or for the remainder of an unexpired 9-year term in case of a vacancy. The Chairman of the Board (*) is designated by the President.

1933-42 Term ARTHUR E. MORGAN *Appointed as Chairman Senate confirmation 5-30-33 A. E. Morgan removed 3-23-38 by Presidential action JAMES P. POPE Senate confirmation 1-12-39	1933-39 Term HARCOURT A. MORGAN Senate confirmation 6-10-33 *Designated Chairman 3-23-38	1933-36 Term DAVID E. LILIENTHAL Senate confirmation 6-10-33
1942-51 Term Sen. Pope reappointed Senate confirmation 5-12-42 Term expired 5-18-51	1939-48 Term H. A. Morgan reappointed Senate confirmation 5-8-39 *Relinq. Chairmanship 9-15-41 Term expired 5-18-48	1936-45 Term Mr. Lilienthal reappointed Senate confirmation 5-18-36 *Designated Chairman 9-15-41
1951-60 Term RAYMOND ROSS PATY Senate confirmation 7-4-52 Dr. Paty died 8-7-57 FRANK J. WELCH Recess appointment 11-25-57 Senate confirmation 7-15-58 Resigned 2-20-59 BROOKS HAYS Senate confirmation 6-23-59	1948-57 Term HARRY A. CURTIS Appointed 5-4-48 Senate confirmation 2-8-48 Term expired 5-18-57	1945-54 Term Chrmn. Lilienthal reappointed Senate confirmation 5-21-45 Resigned 10-28-46 to become AEC Chairman GORDON R. CLAPP *Recess appointment as Chairman 10-28-46 Senate confirmation 4-24-47 Term expired 5-18-54
1960-69 Term Mr. Hays reappointed Senate confirmation 2-8-60 Resigned 2-27-61 AUDBREY J. WAGNER Appointed 2-20-61 Senate confirmation 3-3-61 *Designated Chairman 6-23-62	1957-66 Term A. R. JONES Recess appointment 9-19-57 Senate confirmation 7-15-58 Term expired 5-18-66	1954-63 Term Brig. Gen. HERBERT D. VOGEL *Appointed as Chairman 8-2-54 Senate confirmation 8-11-54 Gen. Vogel resigned 6-30-62 FRANK E. SMITH Appointed 6-25-62 Senate confirmation 7-23-62 Took office 11-14-62 after completing congressional term
1969-78 Term Mr. Wagner reappointed Senate confirmation 5-23-69	1966-75 Term DON McBRIDE Senate confirmation 5-19-66	1963-72 Term Mr. Smith reappointed Senate confirmation 4-26-63 Term expired 5-18-72
		1972-1981 WILLIAM L. JENKINS Appointed 7-25-72 Senate confirmation 9-30-72

PART II

TVA'S GENERAL MANAGERS

The General Manager is TVA's chief administrative officer and is appointed by the three-member Board of Directors. The General Manager's reponsibilities include presiding over the Board meetings and drawing up the agenda; executing programs, policies and decisions approved or adopted by the Board; approving major management methods, organization changes within offices and divisions, major staff appointments and recommending to the Board basic changes in TVA organization; reporting to the Board on overall efficiency, effectiveness and economy of TVA operation; assisting the Board in presenting the budget to the office of Management and Budget and to Congress. (Organization of the Tennessee Valley Authority, Jan. 4, 1976).

Seven persons have served in this position in TVA's 43-year history. Two General Managers were named to the Board of Directors. All have risen from within the ranks of the agency and all have been white males. The last four General Managers were assistant General Managers before taking the top post, but all came through different divisions -- law, personnel, budget, engineering. The two General Managers before that came from personnel.

Only the present General Manager, R. Lynn Seeber, has been a native of the TVA area. The average age when named to the position is 40. The average length of service as a General Manager is six years.

JOHN B. BLANDFORD, JR. -- 1934-39. Born 1897, Brooklyn, New York. Died: 1972. Degree in mechanical engineering at Steven's Institute. Joined TVA in 1933 as assistant to the chairman of the board of directors. Was named Coordinator and Secretary to the Board in 1934 and became TVA's first General Manager in 1937. Resigned in 1939 to become assistant director of the U.S. Bureau of the Budget.

GORDON R. CLAPP -- 1939-46. Born: 1905, Ellsworth, Wisconsin. Died: 1963. Appointed General Manager in 1939 after serving as director of personnel. Joined TVA in 1933. Resigned in 1946 to become chairman of TVA Board. (See Board of Directors Summary)

GEORGE F. GANT -- 1946-51. Born: 1909, Concordia, Kansas. Received bachelor's and master's degrees at University of Nebraska and doctorate degree at University of Wisconsin.

Served with U.S. Office of Education and Federal Security Agency before joining TVA in 1935 as principal research assistant. He was director of personnel from 1941-46. Gant resigned as General Manager in 1951 to take a position with the Board of Control for Southern Regional Education as consultant in graduate education. He also served as consultant on education to the Pakistan National Planning Board and in 1955 was named Ford Foundation representative to Pakistan. He now teaches international relations in the political science graduate school at University of Wisconsin-Madison.

JOHN OLIVER -- 1951-1954. Born: 1912, Bartlesville, Oklahoma. Received bachelor's degree at Oklahoma A&M and master's at University of Chicago. He was director of administrative studies at Oklahoma A&M and administrative officer for Oklahoma State Regents for Higher Education before joining TVA in 1942 as chief budget officer. He was named assistant general manager in 1946 and General Manager in 1951. Oliver resigned in 1954 to become special assistant to the president of Wheland Co., Chattanooga manufacturer of machinery and parts. His resignation came about six weeks after President Eisenhower refused to reappoint Gordon Clapp to the TVA Board, which was speculated as the reason Oliver left the agency. In 1956 Oliver rejoined Clapp and David Lilienthal in the Development and Resources Corporation of New York City and became president of the corporation after Clapp's death in 1964. In 1969, he returned to Chattanooga as assistant to the president and chairman of the operating committee of the American Royalties Corporation, an oil equipment supply company. Oliver is now under consideration for a vacancy on the TVA Board.

AUBREY J. WAGNER -- 1954-1961. Born: 1912, Hillsboro, Wisconsin. Joined TVA in 1934, appointed General Manager in 1954 after serving as assistant general manager for three years. Appointed to TVA Board in 1961. (See Board of Directors Summary)

LOUIS VAN MOL -- 1961-1970. Born: 1910, Antwerp, Belgium. (Grew up in Chicago, Illinois.) Bachelor's degree in civil engineering at Purdue University and master's degree in management at University of Tennessee. He joined TVA in 1936 as a draftsman but transferred to the personnel division in 1941. He was chief budget officer and assistant general manager when appointed General Manager in 1961. Van Mol continued as a part-time consultant to TVA for a short time after his retirement. He now serves as chairman of the Knox County Sheriff's Department Merit Commission. His son, John Van Mol, was named director of public information in 1975.

R. LYNN SEEBER -- 1970- . Born: 1926, Clinton, Tennessee. Bachelor's degree in business administration, master's in industrial management and law degree at University of Tennessee. Joined TVA in 1952 in law division working primarily with Purchasing and Personnel divisions. Served briefly as director of Reservoir Properties and then rejoined law division as solicitor, He was assistant General Manager for a year before becoming General Manager. Seeber is on the Board of Directors of the Atomic Industrial Forum, an international association of 625 orgnization advocating nuclear energy. His father, T. L. Seeber, was Anderson County judge. Seeber lives on a 90-acre Blount County farm on Fort Loudon Lake near Louisville. He is an avid hiker and water sports enthusiast. While at UT, he served as editor-in-chief of the Law Review, member of Order of the Coif, a Torch Bearer, and fraternity president.

President Franklin D. Roosevelt and wife Eleanor tour Norris Dam contruction with TVA board member A. E. Morgan (TVA photo)

PART III

MANAGERS AND DIRECTORS OF TVA OFFICES AND DIVISIONS

Top management staff of TVA are chosen by the General Manager and approved by the Board of Directors.

Almost two-thirds of the managers and directors have been appointed to new positions within the past five years, primarily because of retirements by persons who started with the agency in its early days of the 1930s. But these recent retirements have not filled TVA with new faces at the decision-making level. Two-thirds of the managers and directors have been with the agency more than 20 years and seven are over 60 years old.

The Office of Power, because it operates the nation's largest electric utility, demands nearly 90% of total TVA expenditures and controls 14 of the 35 top positions. It is generally thought to be the part of TVA with the most influence on the Board. Only one of its 14 top staff has worked for TVA less than 25 years.

Another division in which top staff have been with TVA for a long time is the Office of Engineering Design and Construction, where the three top men have each served more than 25 years.

Only five directors were named to their present posts directly from outside the agency. The present General Manager appointed four of these five.

Of the 35 top staff members, 19 joined TVA immediately after college graduation, 10 came from private industry, four from university positions and two from other government agencies.

All the top staff hold at least a bachelor's degree, three hold master's degrees, five have doctorates, three are law school graduates and one is a medical doctor. All are white males.

The average age of a manager or director is 52. The average length of service is 24 years.

Salaries of the top staff range from $39,800 for the General Manager to $38,325 for a division director. When compared to salaries for positions of comparable responsibility in private industry, these salaries are low, especially for top administrators in the Office of Power.

OFFICE OF THE GENERAL MANAGER

R. LYNN SEEBER - General Manager. (See general manager summary.) Office: Knoxville. Salary: $39,800.

HOBART N. STROUD, JR. - Assistant General Manager. Born: 1924, Nashville, Tennessee. Joined TVA in 1947 as a graduate trainee in the office of the manager of power and served in various power office positions in the western and Alabama Districts before being named assistant to the Director of Power Marketing in 1963. The next year he was apppointed branch chief of distributor marketing and in 1970 was promoted to his present position. Prior to joining TVA, he worked as a clerk for a life insurance company and spent two years in the Navy. He attended David Lipscomb College for one year and was graduated in 1947 from Vanderbilt University in electrical engineering. Office: Knoxville. Salary: $39,375.

JOHN S. BARRON - Assistant to the General Manager for Planning and Budget. Born: 1932, Montgomery, Alabama. Joined TVA in 1962 as a specialist in property management. He was promoted to supervisor of Recreation section in 1965 and Director of Tributary Area Development in 1966. He was named to his present post in 1973. He was graduated from Auburn University in forest management and held a position as assistant chief of Alabama State Parks. He also has worked as a forester for timber management and paper companies in Alabama. He teaches a non-profit course on sailing at the University of Tennessee. Office: Knoxville. Salary: $38,850.

LOUIS JOHN VAN MOL, JR. - Director of Public Information. Born: 1943, Knoxville, Tennessee. Was a staff writer with Associated Press prior to taking a job as editor for TVA's Office of Power in 1970. He joined the public relations firm, Holder, Kennedy and Company, Nashville, in 1971, and became senior vice-president and a member of the board of directors. Van Mol was named Director of Information in 1975. His father, Louis Van Mol, Sr., served as TVA's General Manager from 1961-69. Van Mol holds a journalism degree from the University of Tennessee. Office: Knoxville. Salary: $38,325.

ROBERT J. BETTS - Director of Personnel. Born: 1929, Knoxville, Tennessee. Has been director since 1973 when he joined TVA. He holds a bachelor's degree in business administration, master's in industrial management and a law degree, all from the University of Tennessee. He previously worked for General Electric Company in New York and joined Union Carbide in 1956 in Oak Ridge. He was superintendent of the Industrial Relations Division at the Oak Ridge Gaseous Diffusion Plant. Office: Knoxville. Salary: $38,325.

OFFICE OF AGRICULTURAL AND CHEMICAL DEVELOPMENT

LEWIS B. NELSON - Manager of Agricultural and Chemical Development. Born: 1914, New Plymouth, Idaho. Appointed to his present post in 1960 after serving with the U.S. Department of Agriculture for 11 years. He holds a doctorate degree in soils from University of Wisconsin and was a research associate professor at Iowa State University prior to his employment by the government. Office: Muscle Shoals. Salary: $39,375.

GERALD G. WILLIAMS - Director of Agricultural Development. Born: 1917, Victoria, Texas. Joined TVA in 1961 as assistant director of Agricultural Development and became director nine months later. He grew up on a farm and received a bachelor's degree from George Pepperdine College, Los Angeles, California, a bachelor's and master's degree in agriculture at University of California at Davis and a doctorate in plant physiology at Purdue University. He was an assistant professor of agronomy at Purdue. He also has served as director of irrigation research for Olin-Mathieson Chemical Corporation and was in charge of Southern Piedmont Experiment Station of the Agricultural Research Service in Watkinsville, Georgia. Office: Muscle Shoals. Salary: $38,325.

CHARLES H. (BUD) DAVIS - Director of Chemical Development. Born: 1935, Waynesboro, Tennessee. Joined TVA in 1954 as a co-op student while attending Auburn University and was employed full time as a chemical engineer upon graduation in 1958. He was appointed director in 1976. Davis has served on TVA fertilizer research teams to Peru, Chile, and Turkey. Office: Muscle Shoals. Salary: $38,325.

EMMETT A. LINDSAY - Director of Chemical Operation. Born: 1919, Lafayette, Louisiana. Joined TVA in 1942 as a junior chemical engineer after college graduation. He became chief of the maintenance branch in 1962 and assistant director of chemical operation in 1969. He was appointed to his present post in 1972. He received a bachelor's degree in chemical engineering from the University of Southwestern Louisiana. Office: Muscle Shoals. Salary: $38,325.

OFFICE OF ENGINEERING DESIGN AND CONSTRUCTION

GEORGE H. KIMMONS - Manager of Engineering Design and Construction. Born: 1919, Oxford, Mississippi. Joined TVA in 1941 after graduating from the University of Mississippi with a degree in civil engineering. He was involved in the construction of Cherokee, Douglas, Watauga and South Holston

Dams. He was project manager for construction at Johnsonville, Colbert and Bull Run Steam Plants. Kimmons was named to his present position in 1969. Office: Knoxville. Salary: $39,375.

ROY H. DUNHAM - Director of Engineering Design. Born: 1923, Nixa, Missouri. Joined TVA in 1950 as a mechanical engineer and became chief mechanical engineer in 1967. He was named assistant director of engineering design in 1971 and director in 1973. Before coming to TVA, he worked for Allis-Chalmers, Milwaukee, Wisconsin and was an instructor in mechanical engineering at the University of Alabama. He received a bachelor's degree in mechanical engineering from the University of Missouri at Rolla. Office: Knoxville. Salary: $38,325.

HORACE H. MULL - Director of Construction. Born: 1924, Hendersonville, North Carolina. Joined TVA in 1951 as a mechanical engineer. He worked on Widows Creek, Gallatin, Paradise and Bull Run Steam Plants. Was named assistant director of Construction in 1969 and director three months later. He received a bachleor's degree in mechanical engineering from the University of Houston and worked with Houston Lighting and Power Company before joining TVA. Office: Knoxville. Salary: $38,325.

OFFICE OF POWER

GODWIN WILLIAMS - Manager of Power. Born: 1913, Dyersburg, Tennessee. Named to his position in 1976. He oversees the operation of the nation's largest electric system. He was graduated from the University of Tennessee majoring in electrical engineering. He came to TVA in 1939 from Tennessee Electric Power Company, Chattanooga, where he was a system load dispatcher. He was named director of power system operation in 1968, then assistant manager of power in 1971. Office: Chattanooga. Salary: $39,375.

JAMES E. WATSON - Senior Advisor to the Office of Power. Born: 1914, Waterloo, Iowa. He headed the power office for six years before being replaced in 1976. He joined TVA in 1936. In his newly created position, he advises and assists Williams in matters involving power utilization and finance and represents TVA at meetings of national and international power organizations. He has a bachelor's degree in mechanical engineering from the University of Iowa and has held the following positions in TVA: electrical engineer, chief of power contracts branch, director of power marketing and assistant power manager. He has served as vice-chairman of Project Management Corporation which proposes to build the Clinch River Fast Breeder Reactor near Oak Ridge. Presently, Watson is a member of the board and on the steering committee of that organization. He also is chairman of the Electric Power Research Institute. Office: Chattanooga. Salary: $39,375.

T. GRAHAM WELLS, JR. - Assistant Manager of Power. Born: 1916, Newton, Mississippi. Was a rate engineer at Mississippi Power and Light Company before joining TVA in 1940 as an engineering aide. Named chief of Distributor Marketing Branch in 1960. Promoted to assistant to the Manager of Power in 1964 and Assistant Manager of Power for administration in 1970. He received a bachelor's degree in electrical engineering from Mississippi State and did graduate work at University of Tennessee. Office: Chattanooga. Salary: $38,850.

JACK E. GILLELAND - Assistant Manager of Power. Born: 1917, Abbeville, South Carolina. Started with TVA in 1940 as an engineering aide but was an instructor in chemical engineering at the University of Tennessee simultaneously. Spent two years as engineer at Palmetto Quarries Company, Columbia, South Carolina after World War II and rejoined TVA in 1948 as a power supply engineer. He became chief of the power resources branch in 1955 and director of power resource planning in 1970. Gilleland received a bachelor's degree in civil engineering from The Citadel and a master's degree from the University of Tennessee in the same field. Office: Chattanooga. Salary: $38,850.

JOHN G. HOLMES - Assistant to the Manager of Power. Born: 1920, Docena, Alabama. Joined TVA in 1947 as a mechanical engineer in the Division of Power Production. He was appointed to his present position in 1976 after holding the position of assistant director of power production for five years. His responsibilities include financial planning, power research and systems development. He received a bachelor's degree in mechanical engineering at Georgia Tech. Office: Chattanooga. Salary: $38,325.

CHARLES E. WINN - Assistant to Manager of Power. Born: 1924, Acworth, Georgia. Joined TVA as an electrical engineer in 1947. Appointed chief of transmission system planning branch in 1970 and director of Division of Transmission Planning and Engineering in 1973. Named to present post in 1976. His primary responsibilities are in personnel, management services and labor relations. He was graduated from Georgia Tech with a degree in electrical engineering. Office: Chattanooga. Salary: $38,325.

E. FLOYD THOMAS - Manager of Power System Operations. Born: 1916, Savannah, Tennessee. Joined TVA in 1939 as an assistant engineering aide. He served as director of Power Production from 1962 until named to his present position when organizational changes were made in 1976. He supervises the divisions of power operations and power production. He received a bachelor's degree in mechanical engineering from Mississippi State University. Office: Chattanooga. Salary: $38,850.

NATHANIEL HUGHES - Assistant Manager of Power System Operations. Born: 1922, Birmingham, Alabama. Joined TVA in 1947 after graduating from Auburn University with a degree in electrical engineering. He has served as branch chief of power supply planning, director of power resource planning and assistant to the manager of power. He was appointed to his present position in 1976. Hughes has served on the Tennessee Energy Task Force the Kentucky Energy Resources Advisory Commission, and as advisor to the Kentucky Economics Development Commission. Office: Chattanooga. Salary: $38,325.

HARRY S. FOX - Director of Power Production. Born: 1921. Obion County, Tennessee. He is a graduate of the Merchant Marine Academy with a degree in marine engineering. He worked for Reynolds Metals Company before joining TVA in 1948. He has worked as an engineer on five TVA steam plants. He was named director in 1976. Office: Chattanooga. Salary: $38,325

JOHN P. DeLONG - Director of Power Systems Operations. Born: 1918, Mobile, Alabama. Worked as a lineman for Mississippi Power and Light Company for a year after graduating from Mississippi State in engineering. Joined TVA in 1941 in the Construction Division at Pickwick and Fort Loudon Dams. Transferred to Power Systems Operations Division in 1943 and became district superintendent before being transferred in 1965 to Power Construction Division as area construction manager. Named branch chief of power dispatching and production in 1970 and assistant director of division in 1971 and director in 1975. He is deputy director of the Defense Electric Power Administration. Office: Chattanooga. Salary: $38,325.

JOE NEAL BENSON - Director of Power Construction. Born: 1924, Jackson, Tennessee. Started with TVA in 1946 as an engineering aide and was re-employed as an electrical engineer in 1947 after graduating from the University of Louisville with a bachelor's degree in that field. He was named general superintendent of power construction in 1964 and had responsibility for developing TVA's first 500-kV EHV system from Johnsonville Steam Plant to the Arkansas tie at the Mississippi River. He was appointed area construction manager in Nashville in 1970 and to his present post in 1972. Office: Chattanooga. Salary: $38,325.

HUGH G. PARRIS - Director of Power Resource Planning. Born: 1935, Chesnee, South Carolina. Began career with TVA in 1958 as a power supply engineer and was named chief of the power supply planning branch in 1971. He was appointed assistant director of the division in 1973 and director in 1975. He is responsible for developing adequate fuel resources, adminstering coordinated licensing activities and analyzing and evaluating environmental impacts of the power program. He received a bachelor's degree in electrical engineering from

Clemson and a master's degree from the University of Tennessee. Office: Chattanooga. Salary: $38,325.

FRANK W. SMITH - Director of Transmission Planning and Engineering. Born: 1920, Elberton, Georgia. Joined TVA in 1947 after graduating from Georgia Tech with a bachelor's degree in electrical engineering. He was named to his present post in 1976. Office: Chattanooga. Salary: $38,325.

ALBERT O. DANIELS - Director of Power Utilization. Born: 1923, Birmingham, Alabama. Has worked for TVA since 1947, starting as a rate engineer. He served as district manager of the Eastern District, Knoxville, 1968-74 before being named assistant director. He replaces James Burdeshaw, a 40-year veteran, as division director in January 1977. The name of the division was changed in 1976 from Division of Power Marketing. Daniels received a bachelor's degree in industrial management from Georgia Tech. Office: Chattanooga. Salary: $38,325.

DIVISION OF ENVIRONMENTAL PLANNING

PETER A. KRENKEL - Director of Environmental Planning. Born: 1930, San Francisco, California. Joined TVA in his present position in 1974 after holding various positions as a professor and consultant in environmental engineering. He holds a master's degree in civil engineering and doctorate in sanitary engineering from University of California at Berkeley. He was a professor and chairman of the Department of Environmental and Water Resources Engineering at Vanderbilt University prior to his employment at TVA. Office: Chattanooga. Salary: $38,325.

DIVISION OF FINANCE

WILLARD R. STINSON - Comptroller. Born: 1935, Dixon Springs, Tennessee. Named Comptroller in 1974. Stinson joined TVA in 1957 and is a certified public accountant. He was graduated from the University of Iowa. Office: Knoxville. Salary: $38,325.

DIVISION OF FORESTRY, FISHERIES AND WILDLIFE DEVELOPMENT

THOMAS H. RIPLEY - Director of Forestry, Fisheries and Wildlife Development. Born: 1927, Bennington, Vermont. Named director in 1970 after holding various positions in forestry, wildlife biology and range, watershed and recreation management with universities, state agencies and the U.S. Forest Service. He holds a bachelor's degree in forestry and wildlife, a master's in wildlife biology and doctorate in biology. Office: Norris. Salary: $38,325.

DIVISION OF LAW

HERBERT S. SANGER, JR. - General Counsel. Born: 1936, Oak Hill, West Virginia. Joined TVA's law division in 1961 as a staff attorney after graduating from West Virginia University Law School. He was appointed head of the division in 1975. [He taught law at UT College of Law for one quarter in 1962.] Office: Knoxville. Salary: $39,375.

DIVISION OF MEDICAL SERVICES

ROBERT LEE CRAIG - Director of Medical Services. Born: 1936, Toledo, Ohio. Appointed to present position in 1974. Joined TVA in 1968 as a physician and served as chief of special health services and assistant medical director. He received a bachelor's degree from Harvard and was graduated from McGill University Medical School. He completed his internship at Royal Victoria Hospital, Montreal, Quebec. He received advanced training in aerospace medicine at Brooks AFB, Texas and Harvard School of Public Health. He also studied occupational medicine at Harvard. He was in general practice in Wilmington, Vermont from 1965-66. Office: Chattanooga. Salary: $38,325.

DIVISION OF NAVIGATION DEVELOPMENT AND REGIONAL STUDIES

MINARD I. (MIKE) FOSTER - Director of Navigation Development. Born: 1915, Miami, Florida. Joined TVA in 1954 as an economist and was named to his present position in 1967. He holds a doctorate degree in economics from the University of Florida. He was an assistant professor at the University of Miami before being employed by TVA. His responsibilities include planning and engineering waterway improvements and activities to make effective use of the Tennessee River waterway in economic development of the region. Office: Knoxville. Salary: $38,325.

DIVISION OF PURCHASING

JAMES L. (REX) WILLIAMS, JR. - Director of Purchasing. Born: 1925, Phenix City, Alabama. Joined TVA in 1949 as an electrical engineer and was named to his present position in 1969. He is a lieutenant colonel in the Army Reserve. He has a bachelor's degree in electrical engineering from Auburn. Office: Chattanooga. Salary: $38,325.

DIVISION OF TRIBUTARY AREA DEVELOPMENT

H. PETER CLAUSSEN - Director of Tributary Area Development. Born: 1940, Montclair, New Jersey. Started with TVA in 1965 as an attorney in the law division upon graduating from Rutgers Law School. He was named assistant general counsel (environmental) in 1972 and selected for his present position a year later. Office: Knoxville. Salary: $38,325.

DIVISION OF WATER MANAGEMENT

EDWARD H. LESESNE - Director of Water Management. Born: 1920, Charleston, South Carolina. Joined TVA in 1941 as an engineering aide after receiving a degree in civil engineering from Clemson College. Appointed assistant chief of the hydraulic data branch in 1963 and assistant director of water control planning in 1968. Named director of Water Management Division in 1974. Office: Knoxville. Salary: $38,325.

DIVISION OF PROPERTIES AND SERVICES

JOHN S. ROSEK - Director of Properties and Services. Born: 1931, Milwaukee, Wisconsin. Has advanced through the ranks after joining TVA in 1952 as a civil engineer in the project planning branch. He has served as assistant to the General Manager, acting as coordinator for the Tellico Dam Project and for preparation of environmental impact statements on TVA activities. Rosek was manager of properties in Morristown and assistant director of the division before being named director in 1976. He has a bachelor's degree in civil engineering from the University of Wisconsin and was TVA's first Princeton Fellow in Public Affairs. His responsibilities include administration of TVA lands, site planning, property protection and law enforcement on TVA reservations. Office: Knoxville. Salary: $38,325.

Intermediary, a Tennessee
review of journalism,
Jan. 1977

Sparks in the Valley:

Coverage vs. Reporting; A New Deal for the TVA

By Neil G. McBride

If, a few years ago, a prankster with TVA's letterhead had mailed out a press release saying the agency had sunk a coal mine in the basement of Grant's department store in downtown Knoxville, every newspaper and broadcast station in the region probably would have run the story before anyone took a look to see if it were true.

Since that time reporting on TVA has improved. A press corps has grown up which does more than passively edit the agency's press releases. Reporters and their editors have become more interested in TVA's impact on regional and national life. But despite dramatic improvements, reporting on TVA has not yet matched the public's interest or the subject's importance. Tennessee Valley residents are not getting the information they need and deserve about an institution which vitally affects their region's economic and social life.

An examination of how and why press reporting of the Tennessee Valley Authority has changed during the past few years should improve our understanding of both institutions.

Such an examination requires a few definitions. "Press" here includes both print and broadcast media. "Coverage" is not reporting. TVA issues an annual flood of press releases on subjects ranging from major decisions in the power program to the bass population of Norris Lake. The editors who run these stories are not reporting. "Reporting" in this context means looking for the story, not having it delivered. It means going behind the press release and the information office to primary sources and developing enough knowledge about the subject to recognize the relation between seemingly unrelated events.

Finally, reporting does not necessarily imply criticism, and criticism of one issue need not imply condemnation of the institution. Good investigative reporting does not have to put someone in jail. The quality of reporting on TVA should be better, both for its importance to the region and nation and for its importance as a unique source of material for professional journalists.

TVA, a corporate agency of the United States, is the nation's largest producer of electric power, its largest purchaser of coal and one of the region's largest employers—over 25,000 people. It has made the nation's biggest investment in nuclear power. Its programs for air and water pollution, land reclamation and flood control affect millions of people. Its power program, economic development efforts and purchasing policies affect nearly every aspect of economic growth in the Tennessee Valley. Since the energy crisis became part of the public consciousness three years ago, TVA has become the subject of urgent public interest throughout the region and nation.

For the region's professional journalists, good investigative reporting on TVA represents a unique opportunity for national recognition. For the few who have risen to the challenge, such reporting has already won local and national awards.

In 1975, for example, several prestigious prizes were awarded to the *Mountain Eagle*, in Whitesburg, Ky., the best source of investigative reporting about TVA.

Most of the *Eagle's* TVA reporting has been done by free-lance reporter James Branscome. During the past three years, he has written over a hundred

---

Mr. McBride is the staff attorney for the East Tennessee Research Corp., a public interest group in Jacksboro.

Tennessean Library Photo

articles which constitute the most comprehensive analysis of modern TVA problems available.

In fairness to other reporters is should be acknowledged that Branscome is a free-lance writer and as such is free from some of the competing pressures confronting a daily newspaper reporter or commercial broadcaster. He is also a specialist, a stringer for several national publications on Appalachian and TVA affiars. But lack of time does not justify all the regional press's shortcomings in TVA reporting and Branscome's articles continue to represent a model for good investigative reporting.

His stories stand out for their broad range of sources and his efforts to go to TVA's files. His facts are usually undisputed, although most editors would probably not allow his sarcastic, often bitter tone. One story about TVA's 14-plane air force was headlines: "Hello! I'm Aubrey Wagner! Fly Me to Hopkinsville!" The *Mountain Eagle,* July 10, 1975.

The *Eagle's* headlines have announced dozens of major scoops: "TVA and Peabody Deal Behind Doors," October 17, 1974 (first published reports of TVA's billion-dollar plans to purchase Peabody Coal Company); "TVA Putting Pressure on U.S. Forest Service To Allow Stripping in Daniel Boone Forest," Aug. 22, 1974 (acknowledged by a *Courier-Journal* editorial to be the first report of TVA plans to strip mine in a national forest); and "TVA Seizes Mines," Oct. 31, 1974. The mines seized in this last article are those of Arch Minerals. Branscome reported the story's major elements about two years before the episode became the subject of numerous articles, editorials and congressional outrage this summer.

Until a few years ago, little investigative reporting like this was being done about TVA. Specific issues, such as a nuclear power plant or a dam, attracted occasional attention but few reporters studied the institution itself. One author wrote in 1973: "In the past decade, however, with the controversy lessened, TVA power operations have been conducted in relative obscurity." [1]

In making this statement the author ignored the growing controvery over TVA's strip mining policy, a controversy marked by the writing of journalists such a Harry Caudill and the Nashville *Tennessean's* William Greenburg and photographer Jack Corn. In "Strip Mined Poor Look for Villian," (Sept. 19, 1971) Greenburg criticized TVA's policy but gave its top officials a fair opportunity for reply.

But on the whole, TVA's operations were conducted in "relative obscurity," for two reasons.

First, publishers and broadcasters were complacent about the details of TVA's activities because they generally shared its vision of the Valley's future, a future filled with new industry attracted by cheap power. Editors and reporters who fought TVA's battles during its early days and during the McCarthy and Eisenhower years are still especially reluctant to criticize their old friend. Because they confuse hard reporting with condemnation, some of them even seem afraid to look too closely for fear of uncovering a need for criticism.

A second and more subtle cause lies in the impulse behind TVA itself. New Deal reformers wanted to keep "politics" out of the agency. Unfortunately, in our system of government, when politics is taken out, accountability and democracy often follow. A former TVA personnel director wrote:

> The tacit assumption in the TVA Act was that a public official normally prefers to do an honest job, and that the way to obtain competence in the public service is to select men of integrity for the highest positions and then to vest in them complete responsibility for achieving results.[2]

This concept contradicts an important trend in modern government, a trend toward greater public involvement and the fullest possible public understanding of issues. The "tacit assumption" has been amended so that we now rely on greater public accountability as a way to insure competence in public service. TVA's original assumption was incompatible with aggressive reporting and the heightened public involvement it inevitably stimulates. Until recently, the press seemed to share this assumption and did not seek the kind of information about TVA it insists on having about a governor's office or state legislature.

These attitudes remain, but in the last two years reporting about TVA has improved dramatically. This improvement has three principal causes: increased importance of TVA's activities to an energy conscious public; increased criticism by citizens, organizations and public leaders; and open board meetings.

In 1973 the Arab oil embargo precipitated what we know as the energy crisis. In this region the crisis culminated in emergency coal shortages created by the United Mine Workers of America strike in November 1974. Coal prices rose and electric rates soared. Rate increases created tremendous frustration among consumer and public leaders, who for the first time realized their powerlessness to affect TVA decisions and their ignorance of how and why decisions are made.

This frustration coincided with a renewed and growing respect for information and open government which followed the Watergate affair.

In response to this public interest, the regional and national press produced a flood of articles about TVA, focusing generally on rising public dissatisfaction and closed board meetings. The articles generally adopted the same thesis: the pride of the New Deal is being picked on by its old friends. In the *New York Times,* Reginald Stuart's "TVA Swept by a Flood of Criticism" (Jan. 12, 1975) is a good example. Quoting U.S. Senator Howard Baker's opinion that "TVA has lost much of its national constituency," the article described a few causes of discontent but neglected any fundamental discussion of TVA's structure of what might be done to regain support.

Mark McNeely had done the same thing in the

---

[1] Marguerite Owen, *The Tennessee Valley Authority.* (New York: Praeger, 1973), p. 120.

[2] Roscoe C. Martin, Ed., *TVA: The First Twenty Years,* "Personnel Administration," by Harry L. Case (Knoxville: The University of Tennessee Press, 1956), pages 53-54.

Tennessean Photo / Eldred Reane

Knoxville News-Sentinel a few weeks earlier in a front-page story headlined "TVA Is Having Problems With Its Image" (Nov. 24, 1974). About this same time *Barron's* ran "Asleep at the Switch? TVA Lately Has Mismanaged Its Affairs" (Dec. 16, 1974) raising the same questions.

Such articles reached a crescendo when TVA held its first open board meeting on Jan. 16, 1975. Press reporting on the agency has not been the same since.

The events which forced TVA to open its meetings to the public deserve a study of their own. Bob Schulman, media critic for the *Louisville Times*, told part of the story in a colum on Aug. 22, 1974, five months before the meetings were finally opened. After discussing the shame of an agency with TVA's importance doing business behind closed doors, he wrote, "Who in the press has taken up the cudgels against this high-handed behavior? Only the *Mountain Eagle*..."

He described how, in July 1974, *Eagle* reporter James Branscome and a reporter-cameraman from Knoxville's WBIR-TV became the "first newsmen ever to seek entry to a TVA board meeting..."

For six months, Branscome repeatedly tried to attend the closed meetings. His dramatic reports about the millions of dollars being spent behind closed doors—written against the background of Watergate's lessons and public fears over rising rates—were a classic demonstration of the power of the press. Although the *Eagle's* efforts eventually attracted the support of a few daily newspapers, the Knoxville papers were not among them. The debate ended when U.S. Sen. William E. Brock III introduced legislation to make open board meetings mandatory. TVA quickly "volunteered" to hold its board meetings in public.

The first open meeting was a media circus. Reporters from the *Washington Post*, the *New York Times*, and national television networks, a large delegation of local press, citizens group representatives and curious bystanders packed the meeting room.

In his first report of the meeting, the Louisville *Courier-Journal's* reporter Howard Fineman called the meeting a "personal victory" for Branscome, (Jan. 17, 1975). A later editorial in the *Courier-Journal* added with some insight, "But the real pressure came from the public, which once shrugged off such crusades but now seems to have grasped what's at stake." (Jan. 19, 1975).

The forces which have improved press reporting of TVA were set in motion before open board meetings began, but Jan. 16, 1975 will remain a landmark in the history of journalism in the Tennessee Valley. On the first anniversary of open meetings, the *Tennessean's* Keel Hunt looked back and wrote an article which itself suggests the kind of good background reporting which has become more common since open meetings:

> Finally, despite any shortcomings in the format of TVA board meetings, the new open-door policy provides an important opportunity for the news media and private citizens in the region to keep up with TVA policy—whether they take advantage of it or not. That forum is the question-and-answer session that follows each of the board meetings.
>
> For, the first time in TVA's long history, reporters can now expect what amounts to a full-blown press conference, involving the highest officials in the TVA, on a regular basis. (Jan. 18, 1976).

The meetings have made perhaps the biggest difference to Knoxville broadcasters. WBIR-TV's Carol (Marin) Utley, while she covered the meetings, and Steve Dean have usually asked the most informed questions. By contrast, reporters from WTVK-TV often leave before the question-and-answer period begins and miss the most important source of news.

WBIR has been the only local station to do any significant investigative reporting on TVA. Ann Powell, now a *News-Sentinel* reporter, presented a dramatic report on "layer loading"—the practice of loading bad coal with good so as to disguise its poor quality—and won the East Tennessee Sigma Delta Chi "Golden Press Card" award for 1975. That story included film footage showing coal-loading by one of the private companies that sell to TVA and an excellent interview with TVA's general manager. It attracted national attention (it was shown to a congressional committee) and demonstrated the impact good TVA reporting can have. Unfortunately, it is probably the only example of true investigative reporting on TVA by a broadcaster in recent years.

(It is significant that the "Golden Press Card" award for 1974 was also given for TVA reporting—Carson Brewer's 12-part series on the agency's environmental record in the *Knoxville News-Sentinel* [Jan. 6 through Feb. 24, 1974].)

In the past few years, however, radio and television have lagged further behind their audiences' interest and the subject's importance than newspapers in their coverage of TVA.

Newspaper reporting is becoming more professional. Howard Fineman's article, "The French Connection: It Affects TVA Rates," in the Louisville *Courier-Journal* is a good example of the kind of steady reporting that has become more common (Sept. 30, 1976). He analyzed the effect on TVA of a French government corporation's decision to raise nuclear fuel prices. The information about the price was released at a TVA board meeting a few days before the story. The increase was also well covered by the *Tennessean.*

A small piece by Doug Morris in the *Knoxville Journal* demonstrates good feature reporting which does not criticize TVA. "TVA Officials' Pay Below Private Utilities" (June 12, 1976) concluded a chatty interview with TVA chairman Aubrey Wagner (referred to as "the affable redhead") by comparing board salaries to those of private industry. The story was not hard-hitting reporting but it was interesting to compare Wagner's $42,000 salary to the $261,000 the chairman of American Electric Power earns. With a little more effort, Morris could have compared public/private staff salaries, interviewed one or two of TVA's power staff and produced a solid story.

"GAO Studying TVA Operation," by Alan Bernstein of the *Nashville Banner* (Sept. 17, 1976) is a minor piece that demonstrates the value of a reporter who regularly monitors his subject. The story suggested the General Accounting Office was studying TVA because of questions concerning its effectiveness as a yardstick and noted the investigation was not begun at the request of U.S. Rep. Clifford Allen, as was reported in the *Tennessean* and elsewhere. More importantly, the *Banner* story was not stimulated by an event or a TVA press release but by the reporter's sources and initiative.

One of the outstanding pieces of investigative reporting during the past two years was the *Tennessean's* series on James F. Hooper III, a Mississippi dairy farmer nominated by President Ford to TVA's three-member board of directors. Veteran reporter Nat Caldwell conducted a detailed investigation of Hooper's qualifications for the post. A steady stream of articles such as "Contradictions Dot Ford's TVA Choice," June 22, 1975 and "Hooper's Swapping Detailed," July 16, 1975, stimulated a U.S. Senate investigation of Hooper's background. The series could well have been the subject of a national award. Unfortunately, all Caldwell and the *Tennessean* have received so far is a libel suit filed by Hooper shortly after his defeat.* Nevertheless, the investment Caldwell and his paper made in the story suggests a fundamental respect for TVA's importance as an institution.

"TVA Rates Still Give Area a Break," by Jim Dykes for the *Knoxville News-Sentinel* (Feb. 19, 1976) represents a less dramatic but significant example of the kind of major analysis which has become more common during the past two years. Though stimulated by a TVA press release and comprised of information which had been released previously, the story analyzed specific contracts, presented a history of rate changes and discussed the sources of public discontent in a useful summary which readers of a major daily newspaper should have every few months.

Bob Dunnavant, staff writer with the *Huntsville* (Ala.) *Times,* wrote a series of articles about the Browns Ferry fire which demonstrated good investigative reporting and feature writing. "Some Flame Retardant Omitted at Browns Ferry," (April 22, 1975) was an analysis of a report on the fire exhibiting good attention to detail and background in the subject.

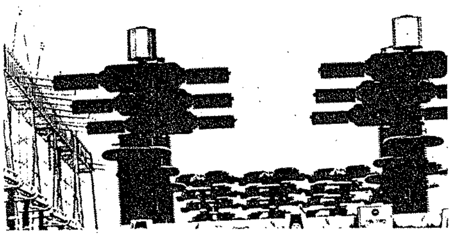
These articles, however, are the exception to the rule of regional reporting of TVA. Unfortunately, the same Browns Ferry fire which Dunnavant covered so well is a good example of a major story overlooked by the regional press.

Everyone *covered* the story, but few *reported* on it; and the press has yet to convey its national significance. With the exception of the *Huntsville Times* and an occasional article in the Nashville *Tennessean,* which has always shown an exceptional interest in nuclear power (its reporting on the proposed Hartsville Nuclear Power Plant has been thorough, if not unbiased), the best analysis of the first and the most thorough reporting on specific facts have come from the national, not regional, press. As the Nuclear Regulatory Commission conducted its investigation it was not uncommon to read of new developments, such as the revelation of previous fires, in two-day-old editions of the *New York Times* or the *Wall Street Journal* before they appeared in the regional press.

Similarly, the regional press has not conveyed the

---

*Ed. note: East Tennessee Research Corp., of which Neil McBride is staff attorney, was also named in that libel suit as a defendent.



Tennessean Photo/Jack Corn

shock waves that Browns Ferry sent through the nuclear power industry. In addition to the intangible effect the fire had on the national debate over nuclear power, the NRC is considering design changes costing tens, perhaps hundreds of millions of dollars and has delayed construction of several plants. David Burnham's *New York Times* analysis of the fire's national impact ran in the *Chattanooga Times* and the *Decatur Daily*, (both on Sept. 22, 1975), but most papers have not covered that aspect of the fire. Most readers are still not aware of the full significance of one of the biggest stories to come out of the region for years.

Such incomplete coverage is indefensible in a region which seeks to make itself the energy capital of the world. The people of such a capital need reporters who understand its workings. At least one local reporter should have set out to write the definitive series on the fire and its significance.

TVA's battle with the Environmental Protection Agency represents another critical story which has not received the reporting it deserves. The outcome of the debate over clean air controls will have a vital effect on national clean air standards, as well as the people of the region, both as consumers and breathers. The press has not presented balanced reports on the controversy.

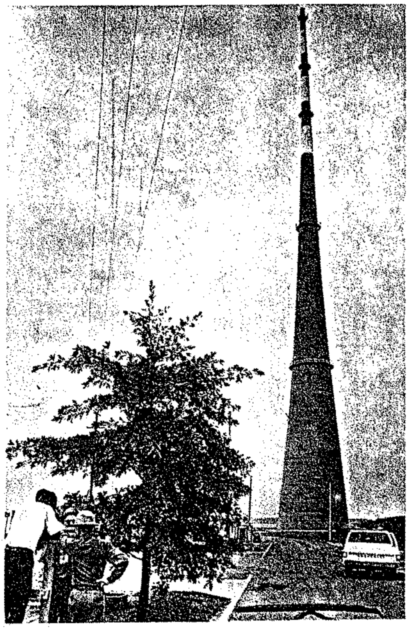
The outstanding reporting on the subject has been by Louisville *Courier-Journal and Times* staff writer David Ross Stevens. His half-page article on Sept. 7, 1975, remains an excellent summary of the issue.

Most stories, however, have been characterized by their utter failure to report EPA's position. A common example is ''TVA Power Change Would Cost Public $250 Million'' by the *Tennessean's* Nat Caldwell (April 21, 1976). In a substantial story involving interviews with several TVA officials and private power company sources, Caldwell made no attempt to state EPA's justification for scrubbers or its opinion on TVA's cost estimate.

The issue has received heavy coverage in East Tennessee, but almost no reporting. Despite the debate's importance to the region (Clean air requirements may force a move away from Tennessee coal markets), no reporter has yet contacted EPA for its evaluation of the health and economic consequences of air pollution or the effectiveness of TVA's proposed solution. TVA's assertion that EPA's requirements have no credible justification has prevailed and has bred a serious public mistrust of government. Even if TVA's position is the correct one, an editor or reporter must be naive, biased or just lazy to cover the debate as though EPA had no position to state.

On this and several other issues the local press regularly runs TVA press releases as facts without clearly distinguishing them as ''TVA said'' and without including opposing viewpoints. A typical headline will read ''Tellico Project Delayed; TVA To Lose $1 Million.'' Only in the body of a story does it appear that a fact or figure given is TVA's opinion and may be disputed by other authorities. Such headlines and editing have a powerful effect on public attitudes and represent a presentation of facts which does not meet elementary standards of professional journalism.

Regional reporting's most serious faults lie not in stories that appear but in those that do not. For example, two congressmen who have shaped TVA's



Tennessean Photo/Frank Empson

RIGHT AGAINST MIGHT
HELP FREEDOM'S LAST STAND
TVA has enough Land For A Recreat
FREE
USA
MAY BE
AMERICA REALLY FREE NOT WITH

Tennessean Photo / Bill Preston

program for decades, Bob Jones of Alabama and Joe Evins of Tennessee, announced their retirement in 1976. Other changes in House and Senate membership also may substantially affect the policies of TVA. The press has not analyzed these changes and their practical significance.

TVA is one of the region's largest employers, but no one has reported on its equal employment efforts or studied its hiring practices for major new projects such as Hartsville or Phipps Bend.

Reporting on TVA's non-power operations has been particularly weak. Although many reporters gladly join TVA's annual tour of Land Between the Lakes, few have tried to evaluate the results of its land use planning, health or economic development policies—some of which have caused real improvement in peoples' lives.

For the past two decades TVA has been administered largely by a generation of leaders who, with Aubrey Wagner, joined TVA in its earliest days. These men shared the experience of the New Deal, World War II, the McCarthy and Eisenhower years and the growth of coal and nuclear generating plants. Like the changes occurring in China since the departure of the generation of leaders who had been with Chairman Mao since the Long March, the departure of the last staff leaders who have been with Chairman Wagner from the beginning will have a tremendous effect on the agency's character and programs. Despite the potential importance of such changes in TVA's top staff, no reporter has yet done more than run the agency's press releases on the subject.

Poor TVA reporting is apparent in national wire service stories that run without mention of their obvious relation to TVA. A glaring example of this failure occurred recently when the Nuclear Regulatory Commission announced it was delaying construction of nuclear power plants across the country. Although the story was given front page coverage, apparently no one contacted NRC or TVA to determine whether any local plants would be affected. Only several days later did statements from TVA reveal that its Hartsville construction would be delayed.

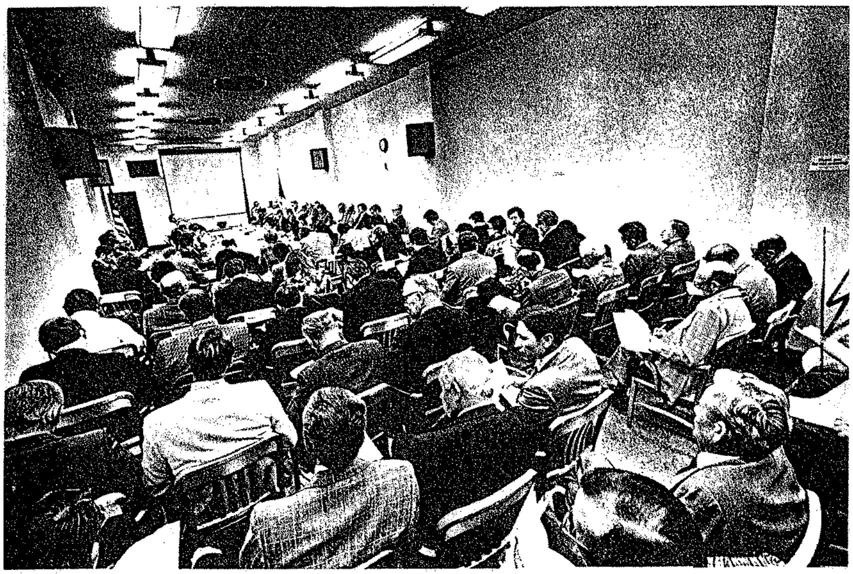
This failure to relate a major wire story to a controversial local issue suggests one of the reasons why TVA reporting is still not so professional as it should be. Although individual reporters often fail to take advantage of a good opportunity for investigative reporting, the responsibility probably lies more with the region's editors and publishers, either for not insisting on better reporting or not allowing sufficient time for those who make the effort.

Again, this poor reporting is due to misunderstanding rather than anything more sinister. As one reporter explained, editors do not try to keep him off TVA stories—they just sometimes ask for justification which wouldn't be requested for a similar piece written about state government. This kind of double standard is common: the *Knoxville News-Sentinel*, which fought vigorously for a state "sunshine" law, never joined the campaign for open board meetings.

Editors are simply not allowing their reporters the time they need to do a good job on a subject as complex as TVA. Every day, for example, Matt Yancey from Knxoville's one-person AP Bureau has to put out the morning hog prices, two 'graphs on every traffic accident between Crossville and Bristol, the latest medical reports on the Vols' injury list and Bernard King's grade point average. By the time he's finished, it is tough to criticize him for not putting out a thousand words on a major change in leadership in TVA's Division of Power or TVA's challenge to NRC's authority to rule on the need for new generating capacity.

But informed articles on either subject would attract national attention and the issues are important to the region's consumers and business and industry leaders. At stake is not just an abstract right to know, as important as that may be, but big money and real change in the region's economic and social life.

It is easy to criticize the wire service and their subscribers for the bureaus' utterly inadequate reporting on TVA. Knoxville's bureau must cover TVA, Oak Ridge National Laboratories, Energy Research and Development Administration, the state university and a federal court, and simply cannot do it adequately with one person. Wire service subscribers, particularly those with small staffs, should have demanded better reporting from TVA's headquarters long ago. While the *Courier-Journal* may have concluded that the public has "grasped what's at stake," most of the region's editors and publishers and many of its reporters have not. They have yet to demonstrate a full understanding of their responsibility to report on the Tennessee Valley Authority. It is time to shrug off the notion that the press should avoid tough reporting because it generally approves of TVA. Good reporting is healthy for any institution; by avoiding specific criticism, we risk arousing the general suspicion that now seems to be growing toward TVA.



Tennessean Photo/Robert Johnson

THE COMMERCIAL APPEAL
A Scripps-Howard Newspaper
MICHAEL GREHL, Editor
Published by The Memphis Publishing Co., 495 Union, Memphis, Tenn. 38101
JOSEPH R. WILLIAMS, Business Manager

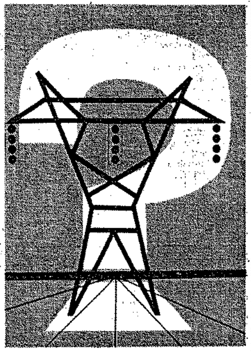
February 24, 1977
page 5

TVA Board Needs Skilled Men To Help Develop Area Energy

By NEIL McBRIDE

JIMMY CARTER is the first president since Franklin Roosevelt with an opportunity to appoint all three members of the Tennessee Valley Authority's board of directors. A vacancy now exists. Chairman Aubrey Wagner's term expires next year and although Bill Jenkins' term does not end until 1981, he has hinted he might leave a little early.

Before the first appointment is made, Carter and the people of the Tennessee Valley should reflect on the role of the board and the standards by which appointments should be judged. Such reflection is critical to TVA because the process of nominating and confirming appointments to the board represents the agency's only true accountability to the public. TVA is unmatched among federal agencies in the degree to which its major decisions are insulated from public participation.



THE WAY CARTER makes the nomination is important. The ritual of floating the names of major candidates is more than just safe politics. It is the public's only meaningful opportunity to debate broad questions of TVA's programs and policies. Before submitting a nomination President Carter should consult industry, government, consumer and environmental leaders and test general public opinion. Although the nomination appears imminent, the region's consumer and environmental leaders, at least, have not yet been consulted.

Good appointments also will be important to President Carter. The past two nominations generated intense public interest among active citizen leaders, state and local officials and TVA consumers. Carter's appointments to the TVA board will be the standard by which the people of the Tennessee Valley will measure his commitment to excellence in public leadership and to solving the energy crisis.

Three considerations might help to establish a fair standard to judge a nominee's fitness: Legal and historical standards set by TVA's founders, the proper function of a board of directors and the experience and background TVA needs at the time a selection is made.

IN CREATING TVA, Congress was explicit in its call for the strongest possible leadership:

> *The board of three directors should not only be sound and experienced men of affairs; they should not only be soundly educated and widely traveled and well-read men; they should be men of constructive vision, to seek to fit the future into the form of the present . . . For such position of trust and responsibility undoubtedly the President will search the nation over for the right men . .*

It is not enough that the appointee be "for" TVA. TVA's founders wanted people of independent judgment who could act on their beliefs. Board members should be chosen and judged by their own merits and achievement, not by the source of their political support.

Congress did not say members must be from the Tennessee Valley. Only 3 of 15 board members have been from this region. TVA's founders called for a national search and a national standard of achievement. The pattern of rotating appointments among valley states began in 1972. When Nixon selected a Tennessean (Jenkins) over a Mississippian (James Hooper), political rumor gave Mississippi the next "slot." In 1975, Ford's nomination of Hooper over widespread public protest seemed to confirm the rumor. After Hooper's rejection, an Alabaman (Thomas Longshore) was nominated and also rejected. Speculation centers again on Mississippi and on Kentucky, which argues, incorrectly, that it has never been represented. (Frank Welch, dean of the University of Kentucky Agriculture School, served from 1957 to 1959.)

THIS BALKANIZATION of TVA's board represents a dangerous precedent. If Carter cannot nominate someone from the valley with unquestionable national stature and qualifications, he would do a valuable service by going outside the region for the next choice.

With Congress's intentions concerning members' individual qualifications, the board's role must be an important consideration in judging future appointments. A board provides a point of view, a public voice, a unifying vision that the staff does not and cannot be expected to have. Such a purpose suggests something about the new appointment: It should not be made from the staff, or from among those who have any significant stake in TVA's present or past policies. Appointing staff members defeats the purpose of having a board.

Finally, we should judge board appointments in light of TVA's greatest need at the time the selection is made. At various periods in its history TVA has needed different qualities in its leadership; for example, the ability to contribute to agricultural development, promote economic growth or establish an efficient power program.

THE DOMINANT fact of American life now and in the forseeable future is the energy crisis. TVA has been severely criticized for its failure to provide national leadership during this emergency. One does not have to accept such criticism of the past to agree that for the future, the next board member should be judged by ability to improve TVA's contribution to national energy policy. TVA's consumers will be the first beneficiaries of such improvement.

TVA desperately needs a leader who understands the complex relationship between energy production, conservation and economic growth; someone who can answer with authority the many public fears created by energy shortages.

This is no time to select an amiable TVA booster looking for a graceful retirement. The next nominee should have the ambition and, most importantly, the skill and experience to lead TVA into a position of national prominence in the formulation and demonstration of a modern response to the energy crisis.

If President Carter is serious about bringing excellence to government and development and developing a unified national energy policy, he can prove it with this appointment.

(Neil McBride is a staff attorney with the East Tennessee Research Corp., a public interest organization at Jacksboro, Tenn., which opposed the appointment of James F. Hooker and Thomas L. Longshore to the TVA board. For three years he has directed the TVA Research Project which seeks to improve public participation in TVA decision making.)

Response of

Neil G. McBride
Nominee to the Tennessee Valley Authority Board of Directors

To Follow-up Questions from Members of the
Senate Committee on Environment and Public Works
February 23, 2010

Questions from Senator Barbara Boxer

1. *A February 2009 Tennessean article found that TVA's board conducts significant work in private committee meetings and that only full board meetings are held in public.*

   Would you commit to producing a report that describes how TVA board members meet to investigate issues and make decisions, and that recommends ways in which this process can be more fully transparent?

   Yes. I have a deep personal and professional commitment to transparency and to the value of public participation in agency decision making. If confirmed, I will encourage the Board to be as transparent as it can, in all phases of its deliberations, with due regard for sensitive agenda items that might involve personnel decisions, the agency's commercial interests and other reasonable exceptions. I would encourage the board to comply fully with the letter and spirit of the Government in the Sunshine Act and to insist on being advised of the specific provisions of the Act that might justify any closed meetings.

2. *Renewable energy standards have proven to be a powerful path to a more balanced energy mix. In the South, North Carolina is looking to get 12.5 percent of its power from renewable sources by 2021. California has set a goal of 33 percent by 2020. The TVA Act mandates that TVA be a national leader on technological innovation and environmental stewardship. What do you recommend TVA do to achieve these goals?*

   If confirmed, I would urge action on two levels. First, and perhaps most important, I would encourage the agency to focus more deliberately on the intent of the TVA Act, by placing each of its missions on more equal footing.

   Second, I would urge the agency not to view the goals of national energy policy to be a ceiling, but to strive for the maximum use of renewable energy sources it can economically achieve. I would encourage that the agency strive to fulfill its statutory mandate by demonstrating technological innovation and effective application. I am aware of the practical necessity to be guided by the opportunities available in the TVA Valley, in terms of climate and geography, as well as the demand characteristics of power use in the Valley, such as the nature of its peak requirements by day and season.

Response of Neil G. McBride

3. *If confirmed, do you agree to meet with EPW staff within the first month of your confirmation to discuss whether the TVA may ask Congress to raise the Authority's debt ceiling, and if so, the reasons for this requested increase?*

   Yes. I have already met with some members of the EPW staff and made it clear to them that I would welcome any future opportunity to hear the Committee's views on the critical issues that TVA faces. If confirmed, I would welcome the most open possible exchange of views with the staff of the Committee and each of its members.

   As a nominee, I have not yet been provided with an analysis of TVA's future debt requirements. In 1974 I testified at a House committee hearing on an earlier request to increase the debt ceiling. (A copy of that testimony is attached in response to Senator Inhofe's question 5.) I still hold the positions I expressed at that time. A request to increase the debt ceiling should be an opportunity for congressional engagement and review of critical TVA fiscal and substantive policies, especially in regard to the effectiveness of its demand management and its policies regarding the mix of production sources. I hope that the board would welcome such scrutiny and be prepared to help the agency articulate – to Congress, the public and its customers – a clear, common sense and compelling rationale for whatever policy it proposes.

4. *What new clean energy and energy efficiency policies would you encourage TVA to use if you were to help shape its next few years on the board? Would you be willing to produce a report for this Committee that describes how those policies could be implemented?*

   If confirmed, the adoption of clean energy and energy efficiency policies would be among my top priorities as a board member. I am not yet aware of all the public and internal studies that TVA has conducted on these issues. I am confident that the board will seek to be briefed regularly on the agency's current and anticipated policies in these areas. I will encourage the board to strengthen the agency's commitment to the use of clean energy and demand reduction.

   In the area of the efficiency of energy use, I hope that the board will encourage TVA to move beyond demonstration projects and move promptly into widespread application of efficiencies that will save its customers money and reduce the need for increased capacity. In encouraging such efficiencies, I expect that TVA will want to explore rate structure issues, incentives that will make local distributors active partners in the process, and on-the-ground retrofitting of homes and businesses to make them more energy efficient and money-saving for customers.

   If TVA does not already have a thorough, up-to-date report on its programs and plans in these fields, if confirmed I would encourage the board to seek one for itself and the agency's stakeholders and the Congress.

Response of Neil G. McBride

5. *If confirmed, do you commit to ensure that health and safety issues associated with coal ash and other waste management concerns are fully addressed? And do you agree to provide a timeline in which problems identified to date will be addressed?*

Yes. In my commitment to encourage equal attention to each of TVA's three statutory missions, I would encourage the agency to view its pollution control efforts as an investment in environmental stewardship, rather than merely as a cost of power production. If confirmed, I would encourage the agency's leaders to establish a culture throughout the agency that does not view state and federal environmental standards as a ceiling for achievement, and certainly not as technicalities to be circumvented if possible.

The Kingston spill has heightened TVA's attention to coal ash and other waste management concerns. TVA is taking action to improve the safety and reliability of coal by-product management. If confirmed, I would encourage the agency to continue and accelerate its focus on beneficial use of certain components of its by-products.

If confirmed, I would encourage the board to support the staff to continue its current commitment to adopt prompt but realistic timelines for implementation of its short-term and long-term response to Kingston clean-up project. In making a timeline, TVA should be candid to Congress and the public regarding the extent to which factors outside its control that might affect progress, such as weather, unforeseen physical and environmental problems and the reliability of outside contractors and suppliers. TVA's credibility suffers when it offers timelines that it is not able to meet, even when delays are caused by factors beyond its control.

Response of Neil G. McBride

Questions from Senator Thomas R. Carper

1. *As we all know, serious environmental problems have troubled TVA in recent years. As a government entity – the TVA should be a leader in our clean energy economy, not a laggard. Therefore, I believe that it is time we have a change in culture at the TVA. TVA needs a culture that treats public safety as the number one priority over public rates. A culture that is dedicated to leading the way in clean, efficient power generation in this country. As a nominee to the Board of Directors of TVA, how are you going to change the culture at TVA and what are some of your ideas on how TVA can be a leader in the clean energy economy, leading out nation towards a clean energy future?*

   I believe that changing TVA's culture is one of the critical challenges that faces the agency. If confirmed, I would frame the issue in terms of the obligation that arises from TVA's statutory mandate. TVA's leadership is making efforts in that direction, which I would encourage the board to support. I am aware that changing the culture of an organization is one of the hardest challenges that institutional leaders face.

   Rather than begin by making specific suggestions, I would ask questions. How is the notion of cultural change expressed in the mission statement and priorities of each of TVA's components, from individual coal and nuclear plant sites to hydroelectric dams and water management? To what extent is commitment to the full range of missions an element of individual evaluations and compensation? How has the leadership communicated with staff about the expectation of considering all three statutory missions, rather than the specific goal of any one component? I am confident that the current leadership is trying to establish such expectations. If confirmed I would encourage the board to support and accelerate such efforts.

2. *Due to understaffing and incidents like the fly ash incident, I have heard that morale among the TVA employees is very low. As a nominee to the Board of Directors of TVA, how will you boost employee morale and ensure we retain the best employees?*

   I believe that TVA's leaders recognize that staff morale needs to be improved. If confirmed, I hope that the board would encourage leadership to make a combined effort of challenging staff to be more professional and effective – especially by paying attention to all three of TVA's missions rather than their specific task – and by establishing higher expectations generally, and rewarding those who respond.

   The Board should not micro-manage this process, but should create the clearest possible expectations that the leadership will be judged by how well it achieves the goal of improving the morale and effectiveness of the line staff and middle managers.

3. *As you may know, Senator Alexander and I have introduced a bill to regulate fossil fuel power plant pollution to clean up our nation's air. Currently, TVA's power generation is*

Response of Neil G. McBride

still heavily dependent on coal. As a nominee to the Board of Directors of TVA, how do you think the TVA could do better in reducing sulfur dioxide and nitrogen oxide emissions?

If confirmed, I would encourage the board to ask TVA's leadership to provide a clear, frank and factually substantiated answer to this critical question. I would encourage the board to establish the clear expectation in TVA's leadership that its success in the mission of environmental stewardship will be judged largely by its progress on this issue. I am confident that TVA's leadership shares this commitment. As a nominee I do not yet have the necessary facts to answer with regards to specific measures. If confirmed, I would encourage the board to recognize the agency's obligation to reduce sulfur dioxide and nitrogen oxide emissions.

4. *In an October 2009GAO study (GAO-IO-47 -Mercury Control Technologies at Coal Fired Power Plants http://www.gao.gov/new.items/d1047.pdD, the GAO found that mercury technology is commercially available, can reduce mercury emission by 90 percent for all coal types, and has been installed on a majority of coal-fired boilers in the United States. And the DOE believes the other boiler types could reduce emissions by blending coal types or using different technologies. In places like Minnesota, adding mercury control technology to local coal plants has only raised household electricity rates by 10 cents a month. Why do you think the TVA has not had a plan to reduce mercury emissions from their coal facilities? As a nominee to the Board of Directors of TVA, how do you think the TV A could do better in reducing mercury emissions from TVA's coal plants?*

Despite the GAO report's conclusion that "Whether power plants will install sorbent injection systems or pursue multipollutant control strategies will likely be driven by the broader regulatory context in which they operate . . ." (Report at p. 27), if confirmed I would encourage the board to challenge the staff to take aggressive, voluntary action to control mercury emissions. If the agency is successful in establishing a culture that values technological innovation and low-cost power, and environmental stewardship, then it would be leading the nation in meeting the challenge of mercury pollution abatement and similar environmental issues. If confirmed, I would encourage the board to promote an organizational culture in which environmental controls are considered to be an investment in environmental stewardship and technological innovation, and not just a cost of power production.

As a nominee I do not yet have sufficient information about TVA's current efforts, or about the relevant characteristics of its coal-fired plants, to comment specifically on what the agency should be doing in this field. If I am confirmed, I would encourage the board to determine to what extent the agency is committed to fulfilling its statutory mission of technological innovation by working with DOE, EPA and others to demonstrate effective control technology and to fulfill its mission of environmental stewardship by reducing mercury exposure to the people of the Valley.

5. *What should the TVA be doing to regulate greenhouse gases? If nominated, how could you foster partnerships between the Department of Energy and the Environmental Protection Agency to help the TVA deploy new greenhouse gas technologies?*

Response of Neil G. McBride

As a nominee, I do not yet have the specific information needed to make specific recommendations for the regulation of greenhouse gases. This issue is obviously central to much of TVA's strategic planning. If confirmed, I would encourage the board to challenge TVA's leaders to make a high priority of regulating the agency's greenhouse gases.

As a resident of Oak Ridge, I have had frequent contact with the scientists, engineers and scholars at DOE's Oak Ridge National Laboratory who are deeply engaged in these issues of energy policy. I am acutely aware of the potential benefit of the kind of collaboration this question addresses.

I recognize that as a federal agency, as the nation's largest public power utility, and as an organization whose statutory mission includes technological innovation and environmental stewardship, TVA has an obligation to be a leader in the understanding of greenhouse gas reduction and the demonstration of effective, practical, cost-efficient technologies for such reduction.

If I am confirmed, I would encourage the board to challenge TVA's leaders to develop partnerships with not only DOE and EPA, but with universities and other centers of knowledge and innovation within the Valley and throughout the nation.

Response of Neil G. McBride

Questions from Senator James M. Inhofe

1. *TVA is currently in the process of rebuilding community trust following the Kingston accident. What actions in Roane County would you suggest that TV A take to regain community trust they haven't taken already?*

   If any benefit has come from the accident at Kingston, it is that TVA's leaders are focusing much more effectively on what the agency needs to do to improve its credibility among the people of the Valley, and that the Congress is increasing its engagement with the agency.

   In Roane County, whose border is about five miles from my home, TVA needs to keep doing what it has begun to do – to tell the truth, to be candid about its success and failures, and to offer the people frequent and genuine opportunities to express their views and hear from TVA about the status of clean-up efforts.

   If confirmed, I hope the board will encourage TVA's leaders to be careful in the promises they make and the timetables they set. Many of the remediation steps that must take place in response to the Kingston spill are highly dependent on factors beyond TVA's control. These factors include weather, the reliability of contractors and suppliers, the discovery of unanticipated environmental problems, and the changing base of information on which remediation strategies are based. If TVA cannot state with certainty when a specific intermediate or final goal can be met, it should say so, and explain why, in plain, common-sense language. People in Roane County, and everywhere else, appreciate honesty and candor. It is better to express genuine doubt than to raise expectations that may not be met, for whatever reason.

2. *TVA currently gets almost 50 percent of its power from coal and just over 30 percent from nuclear. What do you think is the optimal mix of coal and nuclear?*

   As a nominee, I do not yet have enough information to make a specific recommendation on this critical issue. I do know that this question goes to the core of the fundamental decisions that TVA must make in the very near future.

   If confirmed, I would encourage the board to request periodic, complete, understandable and up-to-date information about the factors that must be considered in making this decision. I would expect that the data would relate not just to the mission of power production, but to technological innovation and environmental stewardship. To these missions, I would add two of TVA's other historic missions: water management and economic development. Both nuclear and coal production affect water management; both offer potential for economic development.

   It is my view, as I said when we met last month and in my statement to the Committee, that the board's first obligation is to assure that the residential,

commercial and industrial customers in the Valley have a reliable, fairly-priced source of electricity. To meet that obligation, TVA will, for the foreseeable future, need to rely on both nuclear and coal plants. I am confident that the board and the staff will recognize that making an informed, far-sighted decision as to what the mix between the two should be will be one of its highest management priorities.

3. *Despite the unfortunate accident at Kingston, do you agree that, with the right policies, we can use coal cleanly and efficiently to meet a substantial portion of our electricity demand?*

I am confident that TVA can make its coal-fired plants cleaner and more efficient and that they can meet current and proposed environmental standards. We can anticipate that TVA's current fleet of coal plants will continue to provide a substantial portion of its capacity for the foreseeable future.

As a nominee, I have not yet acquired the information I need to make a specific recommendation about the degree to which TVA's individual coal-fired plants can be made cleaner and more efficient. Each plant offers a unique challenge, based on its local geography, the type of coal it burns, the configuration of its boilers, its existing pollution control technologies, the age of the plant, its maintenance requirements and many other factors. If I am confirmed, I would encourage the board to emphasize to TVA's management the importance of making TVA a national leader in the development of cost-effective pollution control technologies for coal-fired plants and to make its coal-fired plants as clean and efficient as they can be.

4. *TVA currently has $26 billion in outstanding debt and debt-like obligations. Do you support seeking an increase in the $30 billion statutory debt ceiling or should TVA increase rates to address the imbalance between forecast revenues and obligations?*

As a nominee, I have not yet been provided with an analysis of TVA's future debt requirements. In 1974 I testified before a House committee hearing on an earlier TVA request to increase the debt ceiling. A copy of that testimony is attached in response to question five, below. I still hold the position I expressed at that time. If TVA chooses to request an increase in its debt ceiling, that request should be an opportunity for congressional engagement and review of critical TVA fiscal and substantive policies, especially in regard to the effectiveness of its demand management and its policies regarding the mix of power production sources. I hope that the board would welcome such scrutiny and be prepared to help the agency articulate – to Congress, the public and its customers – a clear, common sense and compelling rationale for the policy it proposes.

I believe that the discipline of having to justify and clearly articulate the reasons for its policies and strategic plans, would ultimately make the agency more effective in developing and implementing its plans, and would ultimately build more support for its efforts in the Congress and the public.

Response of Neil G. McBride

5. *Please provide the Committee with copies of all writings, reports, and advocacy speeches on issues related to TVA.*

I have searched through my records dating back to the beginning of my involvement with the TVA. The attached documents represent my best effort to locate all of my writings about TVA, which are now more than 30 years old.

Response of Neil G. McBride

Questions from Senator Lamar Alexander

1. *TVA has a goal to generate 50% of its power from clean sources by 2020. In order to make it from today's level of 40% to the 50% goal, what specific sources of power do you think should be employed?*

   As a nominee, I have not yet been provided with TVA's analysis of the most rapidly available and effective sources of clean power. If confirmed, I would encourage the board to support what is widely recognized to be the cheapest way to meet demand – to reduce demand through aggressive promotion of efficiencies in the residential, commercial and industrial sectors of its customer base.

   In the area of the efficiency of energy use, I hope and anticipate that the board will encourage staff to move beyond demonstration projects and into widespread application of efficiencies that will save its customers money and reduce the need for increased capacity. In encouraging such efficiencies, I would expect that TVA will want to explore rate structure issues, establish incentives that will make local distributors active partners in the process, and promote physical retrofitting of existing homes and businesses as well as improvements in new construction.

   In addition to this demand reduction initiative, if confirmed I would encourage the board to continue to support the staff in its efforts to improve the efficiency of its existing hydropower sources, to support continued investment in nuclear power, to purchase clean power when it is available from reliable, economical sources outside the Valley, and to explore the economic feasibility of green power in the region. In making this commitment, I am aware that the climate and geography of the Tennessee Valley is not as generally favorable to solar or wind generation as conditions in other regions. For this reason, I hope the board would challenge the staff to be creative in meeting its statutory mandate to provide leadership in technological innovation, and look to cutting edge production opportunities.

2. *Do you support TVA's nuclear power program?*

   Yes. As I have said in meeting with you, and in my statement before the committee, the board's first obligation is to assure the continued availability of reliable, fairly priced power to the residential, commercial and business customers of the Valley. I do not believe that the agency can meet this obligation in the foreseeable future without the continued use and expansion of nuclear power. If confirmed, I would encourage the board to support investment in nuclear power when evidence shows that it is an economically justified means to meet proven demand.

3. *Should TVA continue current efforts to build new nuclear power plants at Bellefonte? If so, how many reactors should TVA build at Bellefonte?*

   As a nominee, I have not been provided with an analysis of the pros and cons of placing new nuclear reactors at Bellefonte and if so, how many. If confirmed, I

would encourage the board to offer TVA steady, informed leadership on this issue. I am mindful of the significant advantage to ratepayers of bringing new reactors on line more quickly if they are sited at Bellefonte. I would encourage the board to rely on the assessment and judgment of the TVA staff and the Nuclear Regulatory Commission in justifying the need for nuclear capacity and the practical implications of locating any new reactors at Bellefonte or elsewhere.

4. *Do you agree that it is a bad idea for TVA to adopt policies that allow putting wind turbines on scenic ridge tops in east Tennessee?*

If confirmed, I would hope that the board would encourage the staff to recognize that in assessing the impact of any new source of power, the three missions enumerated in the TVA Act demand an assessment of aesthetic impact as well as economic feasibility. I do not believe that the Tennessee Valley, because of geography and climate, offers as significant opportunities for wind power as other regions of the country.

5. *Should TVA place a priority on installing latest available technology for the reduction of sulfur dioxide, nitrogen oxides, and mercury emissions from coal plants?*

Yes. As a nominee, I have not been given up-to-date information on the costs and benefits of improved control of greenhouse gasses and mercury emissions from its coal-fired plants. If confirmed, I would encourage the board to assertively challenge the TVA leadership to give balanced attention to each of TVA's statutory missions – technological innovation, low-cost power and environmental stewardship. If the board is successful in offering that challenge, then TVA would be much closer to using the latest available technologies to control these emissions.

Senator BOXER. Thank you.

Mr. Sansom.

STATEMENT OF WILLIAM B. SANSOM, NOMINATED TO BE A MEMBER, BOARD OF DIRECTORS, TENNESSEE VALLEY AUTHORITY

Mr. SANSOM. Madam Chairman and Senator Alexander, I appreciate the opportunity to appear before you today. I don't have any family back here to introduce.

I appreciate the nomination, again, for a potential second term from President Obama. And I appreciate the support of Lamar Alexander and Bob Corker and the Tennessee delegation.

I was one of the first ones on this new board to be part of the transition from a three-person full-time board to a nine-person part-time board. It took us a while to figure out we were part-time. But anyway one of the first things we did was develop a strategy for TVA. I think what we looked for was to strengthen our financial stability and our performance; customer satisfaction was important in what we did then and still do. We wanted to be a top quartile performer in what we did.

Then after that we adopted a new environmental policy, which in addition to having reliable low cost power we would have clean power. And Senator, in response to your comment, about 40 percent of your power is clean today. Our goal in this environmental policy was to be 50 percent by 2020 of clean power. With that we have been aggressive in getting our Watts Bar nuclear plant approved and under construction. We hope it is online by 2012.

We are currently underway with our energy efficiency plans, trying to be more efficient in what we do with our customers, working with our distributors to do that, and our demand side also. With that we are working on our opportunity to provide power for electric cars. Since you have been flexible to allow us to come here before you today, I am going to cut my testimony and look forward to the opportunity, if you will, to serve on the Board.

[The prepared statement of Mr. Sansom follows:]

STATEMENT OF WILLIAM B. SANSOM
NOMINEE TO THE TENNESSEE VALLEY AUTHORITY BOARD OF DIRECTORS
U.S. SENATE COMMITTEE ON ENVIRONMENT & PUBLIC WORKS
FEBRUARY 10, 2010

Madame Chairman, Ranking Member Inhofe, other members of the committee, I am honored to appear before you today to be considered for the TVA Board of Directors. I want to thank The President for this nomination, and I am grateful to my home state Senators, Senator Alexander and Senator Corker, along with other members of the Tennessee delegation, for their support.

When TVA transitioned from a full-time, three-person Board to a nine-person, part-time Board in 2006, as new Board members, my colleagues and I wanted to provide an updated strategic direction to TVA and to make good business decisions. That's why one of our initiatives following Senate confirmation was to undertake the development of a strategic plan to guide TVA's efforts. The plan provided direction to TVA management to strengthen its financial performance, continue to improve customer satisfaction, and work to achieve top quartile performance.

As new Board members, we also recognized TVA's unique role in environmental stewardship and protecting the resources of the Tennessee Valley. We built on the strategic plan with the adoption of an environmental policy that will help TVA reduce its environmental impact while still providing reliable and affordable power, a key part of TVA's mission.
I've also served on the Board during a challenging time at TVA following the ash spill at Kingston in December, 2008, and I know this committee, in its oversight role, has followed this issue closely.

If I am reconfirmed, I want to see TVA continue to grow its portfolio of cleaner, lower carbon-emitting energy sources, and I know TVA is working to have fifty percent of its generation come from clean energy sources by 2020. That's why TVA has taken a national leadership role in nuclear power, and I was pleased to be part of TVA's decision to complete Unit 2 at the Watts Bar nuclear plant in Spring City, Tennessee.

I'm also interested in the success of TVA's important energy efficiency and demand response initiatives currently underway with its distributors and the growing partnership with private and public sector organizations to prepare for the arrival of electric cars.

I might add that in 1978, I installed solar panels on my house and am still running geothermal heat pumps. I also had all of my overhangs designed for maximum sun utilization in the winter and summer so I have believed in energy conservation for years.

I am honored to have served on the TVA Board, and appreciate your consideration for a second term. As I said four years ago at my confirmation hearing before this committee, I support TVA's mission, and continue to believe that the TVA Board will be thoughtful, objective, inquiring and deliberate about issues facing TVA.

I am grateful for your consideration of my nomination, and thank you for the opportunity to be with you today.

Environment and Public Works Committee Hearing
February 23, 2010
Answers to Questions for Written Submission
for William B. Sansom

Senator Barbara Boxer

1. During your time on the TVA board, questions have been raised about transparency when the board makes decisions. The Tennessean ran a story last February titled "TVA board meets behind veil of secrecy." The paper found that while board meetings are held in public, committees of the board debate and make decisions behind closed doors. You told the paper those meetings are about "grinding through stuff."

   Given this administration's commitment to transparency, would you be willing to work on Mr. McBride's initiative to make TVA's decision-making fully transparent?

   If confirmed, I am looking forward to working with Mr. McBride, as well as the other new board members as we work to make TVA stronger and consider ways we might make TVA more transparent. I know Mr. McBride will bring a fresh perspective to the Board, and I look forward to hearing his ideas and working with him.

2. I am concerned that you were the chairman of the board at the time of the Kingston coal ash disaster. TVA's own inspector general found that over the last several decades TVA had developed a culture that contributed to the mistakes that led to the spill, including failure to follow best engineering practices and poor communication. The IG recommended a "change management task force" be created to address resistance to needed changes and to increase accountability at TVA. How will you ensure that the board will work to make sure that this type of disaster never occurs again?

   The TVA Board takes the Inspector General's recommendations very seriously. That's why at the Board's July 2009 meeting we tasked TVA's leadership to develop "a remediation plan to eliminate identified deficiencies in systems, standards, controls and culture of accountability in order to earn and maintain public trust." TVA brought McKinsey & Company in to provide additional experience and expertise and an agency-wide organizational effectiveness plan has been underway for some months now.

I think it's also important to note that Kingston might well have been a symptom of TVA's emphasis to pay down its debt as opposed to investing in its plants and other facilities. One of the best ways that the Board can help to assure the Congress and the public that a Kingston-type disaster does not occur again is to make sure that appropriate investments are being made to keep TVA's infrastructure in excellent working condition.

3. If confirmed, do you agree to meet with EPW staff within the first month of your confirmation to discuss whether the TVA may ask Congress to raise the Authority's debt ceiling, and if so, the reasons for this requested increase?

   If confirmed, I would be pleased to meet with EPW staff about the debt ceiling. When I came to the TVA Board in 2006, it was clear to me that for the past couple of decades, TVA had placed a considerable focus on reducing its debt. As a businessman, when I learned that TVA was not spending its depreciation on maintenance, that was a flag to me. It's entirely possible that as a result of the debt ceiling and the pressure to pay down debt, TVA has overreacted to debt over time. That's why I would welcome the opportunity to talk with you about how we continue to bring sound financial principles to TVA's operation, which includes the need to look at the debt ceiling cap imposed in 1979, especially as TVA seeks to grow its portfolio of clean energy.

4. We're at a pivotal moment for TVA and for this country when it comes to the development and use of clean energy technologies. The TVA Act calls for it to be "a national leader in technological innovation, low-cost power and environmental stewardship." If confirmed, would you commit to work on convening a conference with highly respected governmental and non-governmental experts on clean energy technologies, including renewable energy and energy efficiency measures, to collect ideas for a 2151century policy for TVA?

   During my time on the Board, we held a two-day meeting to gather ideas from the public and other interested parties on energy efficiency, demand response and renewables, as part of our work to augment TVA's 2007 strategic plan and educate ourselves to make decisions for TVA's future. If confirmed, I will continue to encourage both my fellow Board members and TVA management to look for ways to work with experts in this ever-changing field. As a nation, we still have work to do on clean energy technologies, and there is an important role for TVA to play.

5. What new clean energy and energy efficiency policies would you encourage TVA to use if you were to help shape its next few years on the board? Would you be willing to produce a report for this Committee that describes how those policies could be implemented?

   A few months before I left the Board, TVA started the design phase of an Integrated Resource Plan. A stakeholder review group is also playing an active role in the IRP, and there are numerous opportunities for public input. I believe this process and plan will provide valuable insight to both the TVA Board and the Committee to shape TVA's future in clean energy and energy efficiency policies.

6. If confirmed, do you commit to ensure that health and safety issues associated with coal ash and other waste management concerns are fully addressed? And do you agree to provide a timeline in which problems identified to date will be addressed?

   I am a proud resident of the beautiful Tennessee Valley, and it's important to me, my family and my neighbors that TVA work to make sure that health and safety is a priority.

   In terms of coal ash management, from my previous service on the Board, I know that TVA has an aggressive plan underway to address and remediate any identified concerns at its other fossil sites.

Senator Thomas R. Carper

As Chairman of the Senate Subcommittee on Clean Air and Nuclear Safety, which oversees the Tennessee Valley Authority, I am happy to see us moving forward on the nomination process for Tennessee Valley Authority (TVA)'s Board of Directors.

1. As we all know, serious environmental problems have troubled TVA in recent years. As a government entity - the TVA should be a leader in our clean energy economy, not a laggard. Therefore, I believe that it is time we have a change in culture at the TVA. TVA needs a culture that treats public safety as the number one priority over public rates. A culture that is dedicated to leading the way in clean, efficient power generation in this country. As a nominee to the Board of Directors of TVA, how are you going to change the culture at TVA and what are some of your ideas on how TVA can be a leader in the clean energy economy, leading our nation towards a clean energy future?

   During my time on the TVA board, I witnessed the restart of Browns Ferry Unit 1, which brought online approximately 1150 MW of zero-carbon emissions to power nearly 650,000 homes in the Valley. This is an important step towards a clean energy future for the Valley and our nation. In recent months TVA has announced more than 1300 MW of new wind power contracts from states like Iowa, North Dakota, South Dakota, Illinois and Kansas where wind is plentiful. I think this is another step towards a clean energy future.

   As someone who installed solar panels on his home back in the 1970's, and also geothermal heat pumps, I am pleased to see TVA investing in green power programs, energy efficiency and demand response initiatives, distributed generation and dual metering opportunities, and other programs to promote clean energy in the Valley. If confirmed, I will work with my fellow board members to foster these and other programs to help TVA grow its role in our nation's clean energy economy.

2. Due to understaffing and incidents like the fly ash incident, I have heard that morale among the TVA employees is very low. As a nominee to the Board of Directors of TVA, how will you boost employee morale and ensure we retain the best employees?

   I have always said that I want TVA employees to be proud to wear their TVA badge when they walk down the street. In my time on the TVA Board, I was

impressed with the many good thinkers that I came into contact with, who care deeply not only about their job, but about TVA's history, service and value to the region. I hope the organizational effectiveness initiative that is underway helps to boost morale, performance and accountability.

3. As you may know, Senator Alexander and I have introduced a bill to regulate fossil fuel power plant pollution to clean up our nation's air. Currently, TVA's power generation is still heavily dependent on coal. As a nominee to the Board of Directors of TVA, how do you think the TVA could do better in reducing sulfur dioxide and nitrogen oxide emissions?

   Since 1977, TVA has had in place an aggressive clean air program to install emission control technology at its 11 coal plants and, as a result, has reduced both sulfur dioxide and nitrogen oxide emissions by more than 80 percent. TVA has spent more than $5 billion on this program to date and anticipates additional spending in the years ahead to meet or exceed regulatory requirements. If confirmed, I will continue to support TVA's clean air program and encourage TVA management to explore cutting edge technologies that may have an application in the Valley.

4. In an October 2009, GAO study (GAO-I 0-47 - Mercury Control Technologies at Coal Fired Power Plants http://www.gao.gov/new.items/d1047.pdf, the GAO found that mercury technology is commercially available, can reduce mercury emission by 90 percent for all coal types, and has been installed on a majority of coal-fired boilers in the United States. And the DOE believes the other boiler types could reduce emissions by blending coal types or using different technologies. In places like Minnesota, adding mercury control technology to local coal plants has only raise household electricity rates by 10 cents a month. Why do you think the TVA has not had a plan to reduce mercury emissions from their coal facilities? As a nominee to the Board of Directors of TVA, how do you think the TVA could do better in reducing mercury emissions from TVA's coal plants?

   If confirmed, I look forward to working with the TVA Board and management on TVA's efforts to reduce all pollutants, including mercury. TVA has made a substantial investment in its emissions reduction program of more than $5 billion and I look forward to continuing to support these efforts. While over 50 percent of TVA's generation comes from coal, TVA has installed both scrubbers and selective catalytic reduction systems on roughly half of its coal capacity, and I understand that the combination of these technologies can also be an effective and reliable way to reduce mercury emissions.

5. What should the TVA be doing to regulate greenhouse gases? If nominated, how could you foster partnerships between the Department of Energy and the Environmental Protection Agency to help the TVA deploy new greenhouse gas technologies?

   During my previous tenure on the TVA board, I encouraged TVA to work closely with both the Department of Energy and the Environmental Protection Agency on various issues, including greenhouse gases, and will continue to do so if confirmed. On a personal note, my late brother was the first Deputy Administrator of EPA, and I am proud of his service. That's why I was especially pleased to meet Administrator Jackson, along with TVA's CEO and other TVA officials, in March 2009, shortly after she came to the job.

6. You were Chairman of the TVA Board for 4 years is that correct? So you were Chairman during the TVA fly ash spill and during the clean air law suits, correct? If nominated for another term on the Board - what will you do differently than in years past?

   I had the honor of serving as Chairman of the TVA Board for a period of just over three years, from March 31, 2006, until May 18, 2009. If confirmed, I look forward to joining the eight other board members in assessing TVA's ability to meet its statutory mission and providing the CEO and his management team with the guidance they need to meet the challenges of the future.

   When the Board transitioned in 2006 from a three-member, full-time Board to a nine-member, part-time Board, we began the process of laying out both a strategic plan for TVA, and following that, an environmental policy which calls for TVA to grow its portfolio of clean energy to fifty percent by 2020. As I mentioned in my testimony, I was also pleased to be part of the decision to complete construction at Watts Bar 2 nuclear plant, which will add more clean energy to TVA's portfolio by late 2012.

   If confirmed, I hope to work with my fellow Board members to make sure that TVA operates in a sound financial condition (which will include addressing the debt ceiling), improves the condition of its plants and other facilities, and continues to improve the quality of life in the Tennessee Valley through its environmental stewardship activities and economic development efforts.

7. Under your leadership, why did the TVA not decide to make the $5 million investment to line the wet fly ash pond at the Kingston Fossil Fuel Facility before the 2008 spill? What steps has the TVA done to address possible leaks in other fly ash ponds? What is the status and potential cost of the TVA spill at Kingston?

   The TVA Board, management, and staff have learned a number of lessons since Kingston. The Board was not presented with a decision to line the wet fly ash pond during my tenure.

   As you know, immediately following the spill, TVA contracted with two top engineering firms. AECOM was hired to conduct a root cause analysis at the Kingston site, and Stantec conducted an intrusive and comprehensive assessment of all of TVA's ash ponds.

   At the Board's direction, TVA has initiated the process of converting all of its existing wet fly ash ponds to dry storage. This process will take eight to 10 years and cost about $1.5 to $2.0 billion.

   The cost of Kingston clean-up activities, as reported in TVA's SEC filings, is currently estimated at $933 million to approximately $1.2 billion. Due to actions taken by the TVA Board in August, 2009 the amount was reclassified as a regulatory asset during the fourth quarter and will be charged to expense as it is collected in future rates over 15 years. From what I understand, clean-up is progressing well at the site, with over 2.6 million cubic yards removed from the river, the 'time-critical' aspect of the recovery, which is slated to be completed in May.

8. In accordance with TVA's 2008 Environmental Policy, TVA is working towards obtaining 50 percent of its power supply from clean or renewable sources by 2010. In your view, is TVA on a path towards meeting this goal?

   TVA is striving to obtain 50 percent of its power supply from clean or renewable sources by 2020. I understand that as much as 40 percent from this previous year came from clean or renewable sources, especially with increased hydropower production as the drought came to an end.

9. In 2003-2004, the TVA Chairman was considering closing Johnsonville Fossil Plant, TVA's oldest and dirtiest coal plant, once Browns Ferry Unit 1 was returned to service. Currently, Browns Ferry Unit 1 is in service and Johnsonville Fossil Plant

continues to run - as Chairman of the TVA Board, did you ever consider shutting down Johnsonville Fossil Plant down and why or why not?

As a member of the TVA Board, I received briefings from staff and participated in discussions about demand in the Valley, capacity expansion planning, transmission and reliability issues, environmental requirements and a number of factors that contribute to decisions around power supply and potential plant retirements. I respectfully add that I am not aware that it was ever conveyed that Johnsonville might be closed when Browns Ferry was brought in service.

10. Under your leadership, did the TVA have any long-term plans to shut down TVA's oldest and dirtiest coal plants? If not, why not?

While serving on the Board we had ongoing discussions about TVA long-term generation planning and that included retiring older TVA fossil plants. As a part of that dialogue the TVA Board considers not only generation needs for a growing economy, but the impact on TVA customers and the ratepayers. Over time, I am confident that TVA will continue to increase its clean energy production, and encourage efforts in energy efficiency. If confirmed, I look forward to being part of those efforts.

As TVA continues to grow its nuclear generation, and is successful in its energy efficiency and demand response programs, then my hope would be that we could meet baseload generation needs for the Valley and consider closing some of TVA's older fossil plants.

Senator James M. Inhofe

1. TVA is currently in the process of rebuilding community trust following the Kingston accident. What actions in Roane County would you suggest that TVA take to regain community trust they haven't taken already?

   Since December 2008, TVA has taken many steps to rebuild trust with the people of Roane County, and especially those most immediately impacted by the incident at the Kingston Fossil Plant. From what I saw prior to leaving the Board, TVA management and staff is working hard to maintain an open dialogue and constant communication with the community.

2. TVA currently gets almost 50 percent of its power from coal and just over 30 percent from nuclear. What do you think is the optimal mix of coal and nuclear?

   The optimal mix of power generation is one that ensures that we can continue to provide low cost energy and build a portfolio of cleaner energy. TVA is striving to have 50% of TVA's energy supply be clean (zero or near-zero sources) by 2020. I strongly feel that the construction of additional nuclear generation is key to providing clean energy at an affordable cost. It's my personal view that the Tennessee Valley would be well-served if TVA could reach as much as 50% nuclear in the future while still keeping a focus on energy conservation efforts as well.

3. Despite the unfortunate accident at Kingston, do you agree that, with the right policies, we can use coal cleanly and efficiently to meet a substantial portion of our electricity demand?

   I think that coal can and should be used in a clean and efficient manner and for the foreseeable future, coal will continue to meet a substantial portion of the nation's electricity demand. As a nation, we should continue research and development of clean coal technologies, carbon sequestration and other innovative approaches.

4. TVA currently has $26 billion in outstanding debt and debt-like obligations. Do you support seeking an increase in the $30 billion statutory debt ceiling or should TVA increase rates to address the imbalance between forecast revenues and obligations?

When I came to the TVA Board in 2006, it was clear to me that for the past couple of decades, TVA had placed a considerable focus on reducing its debt. As a businessman, when I learned that TVA was not spending its depreciation on maintenance, that was a flag to me. It's entirely possible that as a result of the debt ceiling and the pressure to pay down debt, TVA has overreacted to debt over time. As TVA seeks to grow its portfolio of clean energy, we need to look at the debt ceiling cap imposed in 1979, and if confirmed I would welcome the opportunity to talk further with you about this. While the Board is mindful of its mission to provide rates as low as feasible, I also recognize that future rate increases may be necessary in order for TVA to operate as efficiently, safely and responsibly as it possibly can in serving the Valley.

5. Please provide the Committee with copies of all writings, reports, and advocacy speeches on issues related to TVA.

   As a former Board member of TVA, I participated in public meetings of the agency, and videos of these meetings are posted on the website. The TVA website is www.tva.gov.

   Since December 24, 2009, when my term expired on the Board, I have not made any writings, reports, or advocacy speeches related to TVA.

Senator Lamar Alexander

1. TVA has a goal to generate 50% of its power from clean sources by 2020. In order to make it from today's level of 40% to the 50% goal, what specific sources of power do you think should be employed?

   As I stated in the hearing, I want to see TVA continue to grow its portfolio of cleaner, lower carbon-emitting energy sources. TVA is striving to have fifty percent of its generation come from clean energy sources by 2020, and it needs to include nuclear, modernized hydroelectricity, and renewables. From a personal standpoint, as a resident of the Tennessee Valley, I would be comfortable if nuclear reached 50% of TVA's generation portfolio.

2. Do you support TVA's nuclear power program?

   Yes. As I said above, nuclear power must be a critical piece of TVA's future clean energy solution, particularly given the demand for power that TVA must meet (even with aggressive energy efficiency and demand response programs) and the projected growth of the Tennessee Valley. Part of the Valley's projected growth must include preparing for the arrival of electric cars in the marketplace. I would hope that TVA would have enough nuclear capacity to provide clean power in the nighttime hours as electric cars are recharging.

3. Should TVA continue current efforts to build new nuclear power plants at Bellefonte?

   If so, how many reactors should TVA build at Bellefonte?

   As I said in the hearing, if confirmed, and if the Board receives a recommendation from TVA management to construct nuclear units at Bellefonte, I would support that effort. As we look at the Bellefonte site, the TVA Board would then need to determine the future energy demand needs of the Valley and economic costs before determining the number and types of reactors to be built at that site. The potential exists for four units at Bellefonte over time. As the nuclear renaissance continues to grow in this nation, TVA needs to remain poised for other options as well, including the small modular reactors.

4. Do you agree that it is a bad idea for TVA to adopt policies that allow putting wind turbines on scenic ridge tops in east Tennessee?

Yes. Wind power is an intermittent source of energy generation and cannot be counted on for sustained baseload generation, especially in the Tennessee Valley where our geography is not conducive to developing large scale wind projects. While TVA has the largest wind farm in the Southeast at Buffalo Mountain the capacity factor there is only about 20%. To grow its renewable portfolio and to see what the market offers, TVA has contracted over the last few months to purchase wind power from outside of the Valley.

5. Should TVA place a priority on installing latest available technology for the reduction of sulfur dioxide, nitrogen oxides, and mercury emissions from coal plants?

TVA continues to place a priority on emission reductions with one of the most aggressive clean air programs that has invested over $5.0 billion to reduce emissions with future investments to come.

TVA has reduced SO_2 emissions by 84 percent since 1977 and NO_x emissions during the summer ozone season by 82 percent since 1995. All of TVA's 59 coal units have some form of nitrogen oxide controls, with 21 of the largest units having selective catalytic reduction systems installed. TVA's pollution controls also result in significant reductions in hazardous air pollutants including mercury.

Senator BOXER. Thank you very much, Mr. Sansom.

So we have just a couple of minutes here. I have been troubled by something, and I guess I would start with Mr. Sansom, and then I would like to hear a little bit of an opinion down the row if you can. In 2006 North Carolina sued the TVA in an effort to get pollution controls put on some coal plants. Testimony that the State put on North Carolina in the trial, they estimated that TVA pollution caused 1,400 premature deaths a year and $8.4 billion in health care costs.

Now, North Carolina won that suit, and it has been appealed by the TVA. I wrote a letter asking you not to appeal it because as I look at the charter, if you are supposed to be protecting the health of the people why would you fight a court order that said you have to put best available pollution controls on your coal-fired plants?

So I guess what I want to know is whether you, Mr. Sansom, agreed with that decision to fight back against this judge and why, if so; and from the others, if you don't want to get into the details, just a general response. If a court finds that there were deaths, I mean, I don't know why we would want to fight that. Why wouldn't we want to work with a neighboring State to fix it?

Yes, Mr. Sansom.

Mr. SANSOM. Madam Chairman, we are working with EPA to work on a global plan, if you will, at TVA for cleaning up our plants. The North Carolina suit put a pretty harsh burden on us on time. We had schedules to do these clean ups, and we have been installing our clean systems in the coal plants, SCRs. There was no way with that lawsuit to meet the clean up time that was put on us to do that.

Senator BOXER. OK. So you personally believe they have a point, you are going to clean this up, you are going to put the pollution controls on, but you couldn't meet the timeframe laid out by the trial judge? Is that why?

Mr. SANSOM. That is right.

Senator BOXER. That is why you voted to appeal. If I could get a general comment about the responsibility of TVA to clean up and to not pollute in the first place, Mr. McBride, and we will go down.

Mr. MCBRIDE. Madam Chair, I would add to Bill's comment a broader notion that if the Board is successful in getting the staff of TVA to recognize each of its missions and see investment in environmental control as an investment in an important aspect of its overall mission that the agency wouldn't be driven so much by the technicality of an EPA regulation or an order of the court. I would like to see us reach that broader level of commitment.

Senator BOXER. I appreciate that.

Ms. Haskew.

Ms. HASKEW. Well, certainly since I am not yet on the Board I can't speak as a member of the Board. Nor have I read the legal decision. But I am sensitive to the comments that Mr. Sansom said about time in response. I would like to also emphasize that at least by looking at the public press and what it has said about this, not only the North Carolina suit but about Kingston, and what TVA has responded, I have certainly seen a lot of comments, and in comments or discussions with Mr. Kilgore, who is the chief executive officer, increased commitment to TVA to more clean power. Mr. Sansom referenced this, and the desire to have 50 percent in clean power by 2020. Also, I think TVA has moved to close down one of its coal-fired plants that it felt the cost of it, to clean it up, was going to be too great.

So I think TVA is moving in that direction. I think its emphasis upon nuclear power is clearly a part of that.

Senator BOXER. Well, you are going to be a member of the Board, so you are going to help move it in one direction or the other. I just think you need to be a good neighbor. This is not a good situation, North Carolina suing TVA, it is a bad situation.

Ms. HASKEW. Yes.

Senator BOXER. Ms. Brown.

Ms. BROWN. If confirmed I surely would strongly commit to TVA's living up to its obligation of environmental stewardship. I am probably the least familiar with the lawsuit that you have mentioned. But I have read the TVA environmental policy newly published about a year ago. It does commit to meeting a large portion of new electricity demand with efficiency investments. Helping to meet the remaining growth of demand with clean power and upgrading the environmental performance of its existing generation. So I am convinced that VA appreciates—has a strategy to going forward. I will certainly help in that regard.

Senator BOXER. Yes, you may need to push a little bit.

Senator, the floor is yours. Then Senator Whitehouse, and you will be on your way.

Senator ALEXANDER. Thanks, Madam Chair.

I appreciate Senator Boxer's question. Maybe the Congress will be able to give TVA a little help on this, Madam Chair. Senator Carper and I have been introducing legislation for the last 6 years to require national standards for sulfur, nitrogen and mercury, now mercury in emissions. The landscape has changed because we now have better technology for mercury. We have 11 co-sponsors of that legislation, 5—about an equal number of Democrats and Republicans and one Independent. That will help the Tennessee Valley greatly because while TVA is the source of some of our dirty air a lot of it blows in from other States. We simply can't clean up the Valley by ourselves.

So I am very hopeful that, Madam Chair, that we will be able to consider that legislation this year. We have some differences over carbon and how to approach it in the Senate. But I see a consensus that we know what to do on sulfur, nitrogen, mercury, and there is no excuse for not going ahead with it in terms of our health, in terms of the smog of the Smokies, in terms of being able to recruit jobs. I mean, a Volkswagen supplier can't come to Chattanooga if Chattanooga can't get an air quality permit because dirty air blows in from Ohio or from TVA plants, either one.

So I understand that can't all be done overnight. But it needs to be done. The bottom line to me is there is really not any excuse for TVA operating coal-fired power plants that don't have the current available technology for sulfur, nitrogen and mercury emissions, period, which leads me to my question.

Mr. Sansom, I will start with you.

If that means that we might have fewer coal plants in the future, and if the region is growing, and even if you do a good job on conservation and efficiency, which I hope you will do, where is TVA going to get its power? If the answer is nuclear, are you prepared—I know TVA restarted the application for Bellefonte I reactor and has the option of going to Bellefonte II, III and IV. Are you prepared to complete the reactor at Bellefonte I?

Mr. SANSOM. Senator, I will first answer you on the clean part. We think this is part of our solution. We have some old, dirty coal plants. If we can build these nuclear plants, and even if we were to miss the call on demand, which I might say even on January the 7th—I think the 7th or the 9th—we had almost our peak demand again even though the economy is down, consumption of energy is down. What we are doing, we have gone back and gotten our deferred status back for Bellefonte I. And the next in that process would be to get a construction permit from NRC to finish that plant that at one point was about 85 percent complete. It is now about 65 because we took things out of it over the years.

But that would allow us to bring on that plant about 2017. Then we are also looking at Bellefonte II, which would be behind that. And then we were involved in New Start, still there. We have put this ahead of New Start.

So to answer your question, yes, we are trying to pursue nuclear. If Watts Bar comes online in 2012, and then we hope Bellefonte I in 2017 and then maybe four or 5 years later, II. So that is our aim, to try to get clean air, if you will, and have clean power.

Senator ALEXANDER. Mr. McBride.

Mr. MCBRIDE. I believe that TVA has more opportunity for demand reduction than it is assuming. And if it challenged in an appropriate way might be able to reduce demand, as I say, more than they are projecting. Having said that I don't think they could reduce demand enough to eliminate the need for new production, which in the short run almost certainly has to come from new nuclear power generation.

Senator ALEXANDER. Ms. Haskew.

Ms. HASKEW. I agree in large part with Mr. McBride here. I think that we ought to pursue or TVA ought to pursue and its distributors ought to pursue all those activities that will lead to demand reduction and more efficient use of energy. But then as we—to support economic growth I think we have to have the low cost power, and that additional power may have to be through nuclear. I don't see in all the information that I have read about clean coal technology any that can really show that it is, at this point, clean.

Ms. BROWN. I look forward to working with the CEO of TVA on the development of a new strategic plan that would lay out a path forward for meeting the mission of the corporation. I do hope that one of the tasks will be to try to explain as much of the combined heat and power that exists in the Valley. I know that there is a lot that is going unexploited. I hear about 5 megawatts of vented heat from metals production facilities that can't be captured for various reasons.

I am quite interested in exploring every little bit of waste heat and waste power that we can capture to offset the need for investing in upgrades and new expansion, although I am pro-nuclear. I do think it needs to be part of the solution. I look forward to bring Watts Bar online quickly and to exploring how many additional nuclear reactors are needed.

Senator ALEXANDER. Madam Chair, I have other questions which I will submit in writing. I know Senator Whitehouse hasn't had a chance to say anything.

Senator BOXER. Yes, Senator Whitehouse, and then we are going to vote. I have just the pro forma questions I have to ask each of you.

Yes, Senator.

Senator WHITEHOUSE. Thank you, and to each of you, welcome and congratulations on your nominations. Well done getting here through the adverse conditions that Washington, DC, presents to travelers today.

Let me ask just very quickly each of you whether Earth's atmosphere and climate are being significantly and adversely affected by man-made carbon pollution and other greenhouse gases.

Ms. Brown.

Ms. BROWN. I do think that the bulk of the evidence suggests that mankind is interfering with the global climate. As a result, the climate is warming and becoming more extreme. We do need to attend to that. The certainty is not 100 percent, but we need to take a risk averse and insurance type of approach and consider what we can do that is good for the economy and good for the environment in the meantime while we figure out exactly the extent and the cause of the problem.

Senator WHITEHOUSE. Ms. Haskew.

Ms. HASKEW. In the economics texts from which I teach my students it refers to climate change and global warming are referred to as the mother of all externalities. Which means that by the time we could see the full negative impact of these forces it might be too late to address them. Because that might be 40 or 50 years.

So yes, I think the science does indicate that greenhouse gases are a problem for our environment.

Senator WHITEHOUSE. Mr. McBride.

Mr. MCBRIDE. As I said earlier about the need to recognize all of TVA's missions I would start by saying it is important to recognize the health, environmental, human impact of all of TVA's operations and not be guided simply by the technical limits of Federal or State regulation. Having said that, I believe that there is enough evidence to suggest that there are global impacts beyond the local public health and environmental impacts that the prudent thing for all producers of power and carbon emissions and other greenhouse gases to do is to assume that they are having an impact.

Senator WHITEHOUSE. Mr. Sansom.

Mr. SANSOM. I agree that TVA has an impact, and we need to continue to work on cleaning up what we do.

Senator WHITEHOUSE. You don't doubt that. We hear some remarkable things said in this room about climate change from time to time. I just wanted to make sure that there was no doubt in anybody's mind here that climate change is happening, and it is happening as a result of human emissions, and that the consequences are adverse for our planet and species. I am seeing four nodding heads. So I will leave it at that.

In the short minute I have remaining, let me ask this. There has been substantial talk about the impossibility of a Government-run entity to run efficiently and to in fact manage anything. And here stands TVA, lasted quite a long time. Comparing yourselves to privately owned electric utilities how would you react to the theory that if it is Government-run it must be inefficient and wasteful?

Mr. Sansom.

Mr. SANSOM. I am a business person. I would have tended to say that private industry might do a better job. TVA is—what I will say now after being there for about 4 years—is a very good model. I think we have the opportunity to run it right. I think this Board structure has helped it, with our strategies and what we are doing, with what we have done as a Board to get management and have these goals of being as good as any corporate performance. You are our shareholder. I think we can operate and be responsive to our shareholders and have low cost power and do it in the model that TVA is. I think it is an excellent model.

Senator WHITEHOUSE. I am down to 12 seconds. Does anybody disagree that by virtue of being—does anybody disagree with the proposition that a Government-run organization can be as efficient as a privately run organization? Nobody disagrees with it. Good.

Mr. MCBRIDE. I would restate it, Senator, and say that it can provide a different kind and maybe even more important value to the people and the mission that it is intended to serve.

Senator WHITEHOUSE. Thank you. Well said.

Senator BOXER. Thank you, Senator.

Well, I am going to go down the row, starting with Ms. Brown, and ask you these pro forma questions, but very important ones.

Do you agree, if confirmed by the Senate, to appear before this committee or designated members of this committee and other appropriate committees of the Congress and provide information, subject to appropriate and necessary security protection, with respect to your responsibilities?

Ms. BROWN. Yes, I do.

Ms. HASKEW. Yes, I do.

Mr. MCBRIDE. Yes.

Mr. SANSOM. Yes, I do.

Senator BOXER. All right. Two, do you agree to ensure that testimony, briefings, documents, electronic and other forms of communication are provided to this committee and its staff and other appropriate committees in a timely manner?

Ms. BROWN. I do.

Ms. HASKEW. I do.

Mr. MCBRIDE. Yes.

Mr. SANSOM. I do.

Senator BOXER. Do you know of any matters which you may or may not have disclosed that might place you in any conflict of interest if you are confirmed?

Ms. BROWN. I do not.

Ms. HASKEW. No.

Mr. MCBRIDE. No.

Mr. SANSOM. No.

Senator BOXER. Excellent. Well, we want to really thank you from the bottom of our hearts for all of this. I want to thank Senator Alexander, because he really single handedly kind of hauled you back in here when we thought you were already gone. And it turned out you weren't. So this is good.

And now we wish you well. Have a good flight back.

Senator ALEXANDER. Madam Chair, may I thank you?

Senator BOXER. Yes, you may.

Senator ALEXANDER. On behalf of all of us Senators, but I think the witnesses and the families and TVA especially, your willingness to be really flexible today has been a big help. And I thank you for that.

Senator BOXER. Happy to do it. Listen, it is out of respect for all these fine people and their families. But in addition, the job is so crucial. We just in a couple of questions laid out how important the job is. It is amazingly important. You could really just lead the country in this whole arena. So we are excited to have you on board and look forward to moving your nominations expeditiously.

Thank you very much, and we stand adjourned.

[Whereupon, at 4:08 p.m., the committee was adjourned.]

[An additional statement submitted for the record follows:]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Thank you, Madam Chairman, for making last-minute adjustments to today's hearing. I think it makes sense, given the weather situation, to hold a hearing for all of these nominees this afternoon. I want to extend a welcome to the nominees and their families here today. I will be supporting all of the nominees, and I look forward to working with them.

Let me first address the nominee for Inspector General of the Environmental Protection Agency, Arthur Elkins, Jr. Mr. Elkins, you have your work cut out for you. Among other things, there needs to be an unbiased investigation into how EPA made its endangerment finding for greenhouse gases. This finding will lead to policies that destroy jobs and raise energy prices for consumers.

I also want to note the numerous inquiries and document requests from the minority of this committee to EPA. Those inquiries and requests have either gone unanswered or were addressed in a grossly incomplete fashion. Take a look at this chart. It should give you a fairly good sense of the Agency's unresponsiveness. Mr. Elkins, I hope you will work with me to assure taxpayers that EPA is following the law and that it conducts business with openness and transparency.

Today we also have a nominee for the Northern Border Regional Commission (NBRC), Sandford Blitz. I look forward to hearing how Mr. Blitz plans to manage this new program and how to make it work effectively for those it is designed to help. And we have Earl Gohl as the nominee for the Appalachian Regional Commission (ARC).

For both Mr. Gohl and Mr. Blitz the rules and regulations this Administration has imposed and wants to impose have at least one thing in common: they disproportionately impact rural America. So I say to you today: stand up for rural America, and be sure that its voice gets heard.

Now let me turn to our TVA nominees. A critically important issue is how TVA is responding to the Kingston coal ash spill that occurred in December 2008 in Roane County, Tennessee. TVA's CEO, Mr. Tom Kilgore, made a commitment to the community to clean up the site as quickly and safely as possible. I believe TVA is living up to its commitment. I would like to hear the nominees' thoughts on TVA's progress, what TVA can do better, and how your role on the Board will ensure that TVA continues to make good on its promise.

As TVA continues clean up, EPA and the Obama administration are supposedly close to finalizing a proposed rule to regulate coal combustion waste. The proposal, from what we have gathered, attempts to regulate coal combustion waste as a hazardous waste under title C of the Resource Conservation and Recovery Act.

Let's not forget that Kingston was an engineering failure. That is where our focus should be—we need to ensure that the coal ash impoundments are structurally sound. Taking the hazardous waste course that EPA is considering will not ensure the structural safety of the impoundments. Moreover, it will prevent the beneficial use of coal combustion waste. This will impair our ability to build and improve roads and infrastructure, which is so badly needed in today's economy.

Madam Chairman, I look forward to hearing from the witnesses.

○